

UNIVERSITY OF ALBERTA LIBRARY



0 1620 0233 4132

OIL SPILL COUNTERMEASURE
LOGISTICS STUDY

SUMMARY REPORT

TD
195
P4
O394
c.1
POLAR

ABSTRACT

The Summary Report is one of two major reports submitted as part of the Oil Spill Countermeasure Logistics Study of the Transportation Infrastructure. This is one of the projects commissioned by the Department of Fisheries and the Environment as part of the AMOPS program. A second Analysis Report also forms part of this project. The appendices to the project form the basis for the discussions in both the Summary Report and the Analysis Report and are included under separate cover.

The Summary Report provides tabulated listings of the various aspects of the transportation infrastructure for which information was collected. Much greater detail is contained in the appendix sheets. The study itself concerned a collection of data for the air system, marine system, land system and communities in the north.

The air system information includes tabulations of the characteristics of the available aircraft for use in the north in terms of their classification as heavy, medium or light transports or helicopters. Of importance also is the summary of the companies presently operating in the north and their types of licence. The report also includes a description of the air strips available for operations in the north and the contacts and sources from which the information was gathered. A section is also included on special technology and future developments for the air system and the marine and land systems.

The summary of the marine system includes tabulations of the available vessels which have had experience in the north, the government agencies and companies operating in the north, and a more detailed description of the ports and anchorages which would be available for use in the event of an oil spill. This includes the description of categories of ports and anchorages, selected sites, description of pollution control zones, their chart numbers, the degree of shelter and anchorage. As before, there are descriptions of the sources and contacts and special technology in future developments in the marine system.

The summary of land systems includes a description of the rail access to the north, the road access to the north, the possibility of use of air cushion vehicles and as before, sources and contacts and future developments. The summary of communities in the north describes the population, location and facility available.

The information included in this report and the Analysis report has been summarized by region within the Arctic. Five separate regions have been considered:

- Western Arctic
- Eastern Arctic
- High Arctic
- Hudson Bay/Ungava/Foxe Basin
- Labrador Coast

This has been undertaken to provide a convenient basis for comparison of the various systems within a given area.

Rec'd: FEB - 3 1987
 Order No.:
 Price: 6ft
 Acc. No.:

BOREAL INSTITUTE
 LIBRARY


TABLE OF CONTENTS

	PAGE
Abstract	iii
Resume	iv
Table of Contents	v
List of Tables	vii
Acknowledgements	viii
1.0 Introduction	1
2.0 Summary of Air Systems	3
2.1 Available Aircraft	3
2.1.1 Heavy Transports	3
2.1.2 Medium Transports	3
2.1.3 Light Transports	5
2.1.4 Helicopters	5
2.2 Companies Operating in the North	5
2.2.1 Commercial Operations	5
2.2.2 Private Companies	5
2.3 Operational Airstrips	10
2.4 Sources and Contacts	17
2.5 Updating	17
2.6 Special Technology and Future Developments	18
3.0 Summary of Marine System	19
3.1 Available Vessels	19
3.2 Government Agencies and Companies Operating in the North	19
3.3 Ports and Anchorages	19
3.3.1 Categories of Ports and Anchorages	19
3.3.2 Selected Sites	32
3.3.3 Pollution Control Zone	32
3.3.4 Chart Number	32
3.3.5 Degree of Shelter	32
3.3.6 Anchorage	32
3.4 Sources and Contacts	32
3.5 Updating	32
3.6 Special Technology and Future Developments	33
3.6.1 New Mines	33
3.6.2 Oil	33
3.6.3 The Polar Gas Project	33
3.6.4 Liquid Natural Gas (LNG) by the Marine Mode	33
3.6.5 The Beaufort Sea	34
3.6.6 Miscellany	34
4.0 Summary of Land Systems	35
4.1 Rail Access to the North	35
4.2 Road Access to the North	35
4.2.1 All Weather Roads	35
4.2.2 Ferries	36
4.2.3 Winter Roads	36
4.3 Air Cushion Vehicles	36
4.4 Sources and Contacts	37
4.4.1 Rail Contacts	37
4.4.2 Road Contacts	37
4.4.3 Trucking Contacts	37

	PAGE
4.4.4 Air Cushion Vehicle Contacts	38
4.4.5 Air Cushion Vehicle Data Sources	38
4.5 Updating	38
4.6 Future Developments	38
5.0 Summary of Communities	41
5.1 Communities in the North	41
5.2 Sources and Contacts	59
5.2.1 Northwest Territories	59
5.2.2 Quebec	59
5.2.3 Labrador	59
5.3 Updating	59
5.4 Future Developments	59

LIST OF TABLES

NO.	NAME	PAGE
1	Aircraft Characteristics — Fixed Wing	4
2	Aircraft Characteristics — Helicopter	6
3	Aircraft by Companies	7
4	Area of Operation of Arctic Carriers	8
5	Helicopters by Companies	8
6	Oil Companies Operating Arctic Equipped Aircraft	9
	Airport Operational Characteristics	
7A	Western Arctic	11
7B	Eastern Arctic	12
7C	High Arctic	13
7D	Hudson Bay/Ungava/Foxe Basin	14
7E	Labrador Coast	15
8	Airports by Location & Classification	16
9	Vessels Engaged in Arctic Resupply by Year	20
	Marine Vessel Operational Characteristics	
10A	Tugs	22
10B	Merchant Generals	23
10C	Merchant Tankers	24
10D	Icebreakers	25
10E	Miscellaneous Ships	26
11	Agencies and Companies Operating in the Arctic	27
	Ports and Anchorages in the Arctic by Location	
12A	Western Arctic	28
12B	Eastern Arctic	29
12C	High Arctic	29
12D	Hudson Bay/Ungava/Foxe Basin	30
12E	Labrador Coast	31
13	Ferry Data	36
	Community Support Facility Characteristics	
14A	Western Arctic	42
14B	Eastern Arctic	43
14C	High Arctic	44
14D	Hudson Bay/Ungava/Foxe Basin	45
14E	Labrador Coast	46
	Available Water Transport Vessels	
15A	Western Arctic	47
15B	Eastern Arctic	48
15C	High Arctic	49
15D	Hudson Bay/Ungava/Foxe Basin	50
15E	Labrador Coast	52
	Available Construction Equipment	
16A	Western Arctic	53
16B	Eastern Arctic	54
16C	High Arctic	55
16D	Hudson Bay/Ungava/Foxe Basin	56
16E	Labrador Coast	58



Digitized by the Internet Archive
in 2023 with funding from
University of Alberta Library

ACKNOWLEDGEMENTS

The authors would like to acknowledge the excellent cooperation received from Mr. K. Meikle and Mr. W. Logan as representatives of the Environmental Protection Service. Also without the cooperation and efforts of the staff of many governmental agencies, the railways, airlines and shipping companies surveyed in the study, our task would have been much more difficult. The Department of National Defence deserves special acknowledgement for their cooperation. In particular Captain Jordaan and Major Paukstaitis provided excellent material.

Figures 59, 60, 61, 62, 63 in the Analysis Report were reproduced with the permission of Northern Associates (Holdings) Ltd. who originally prepared the material under contract to the Ministry of Transport for a report entitled "Arctic Resources by Sea".

1.0 INTRODUCTION

This report is an executive summary of the data collection phase of the Oil Spill Countermeasure Logistics Study. Chapters 2, 3, 4 and 5 present summaries of the air systems, marine systems, land systems and communities respectively. The data have been collected from a wide variety of sources and recorded on forms developed specifically for this project. These data sheets are contained in an Appendix Report and represent the source for the following summaries.

For the purpose of this report the study area has been divided into the following five geographic regions as shown on Map 1.

- a) Western Arctic
 - b) Eastern Arctic
 - c) High Arctic
 - d) Hudson Bay/Ungava/Foxe Basin
 - e) Labrador Coast
- a) The Western Arctic is identified as that area lying west of an imaginary line running north-south through the centre of Somerset Island and the Boothia Peninsula and south of Melville Sound. This area encompasses all the settlements and ports on the western Arctic Coast (including Spence Bay) and on Banks Island, Victoria Island and King William Island.
- b) The Eastern Arctic in this instance, is predominantly eastern Baffin Island. The borders of this region are as follows: The Western boundary is the north-south line running from Barrow down the centre of Somerset Island and the Boothia Peninsula; the northern and eastern limits are Lancaster Sound and a line running down through Davis Strait. The southern limit is a line running from the Gulf of Boothia through the centre of Baffin Island easterly to its southern tip including Frobisher Bay.
- c) The High Arctic area is defined as that area lying north of an imaginary line connecting the Arctic Ocean to Baffin Bay, running through Lancaster Sound, Barrow Strait, Viscount Melville Sound and McClure Strait.
- d) The Hudson Bay/Ungava/Foxe Basin area includes all the ports and settlements surrounding the Foxe Basin, Hudson Bay, Hudson Strait and Ungava Bay as far east as Cape Chidley.
- e) The Labrador Coast includes all settlements on the Labrador Coast from Cape Chidley to 53° N latitude.

2.0 SUMMARY OF AIR SYSTEMS

The ability to transport men and equipment on short notice would depend primarily on the capacity of the air system composed of a fixed wing fleet and a rotary wing fleet. The fixed wing fleet available is composed of a variety of makes and models with varying configurations for carrying passengers and/or freight. The fleet can be divided conveniently into three classifications as follows:

- *Heavy Transports*
Aircraft capable of long range delivery of large loads at relatively high speeds. These aircraft would serve as the major transport from southern supply stations and would be capable of transporting some types of construction vehicles.
- *Medium Transports*
Aircraft capable of a shorter range and delivery of smaller payloads. These craft would not be capable of transporting large construction equipment and would be used for more localized delivery.
- *Light Transports*
Aircraft capable of short range transport to the operational sites. These aircraft would operate from shorter airstrips but would be only capable of transporting relatively small loads. They would serve a reconnaissance role as well.

Helicopters can also be defined as light, medium and heavy, but this classification pertains only to load capacity. The relatively slow ferrying speeds eliminate this mode as a long range delivery vehicle. The major benefit of helicopters relates to the small area required for landing and the flexibility with respect to size and shape of package which can be transported externally.

The airstrips in the north are not sophisticated in equipment or facilities for repair and accommodation. The life of many strips is limited by their purpose (exploration, DEW Line) or by their construction base (ice). The status of the airstrips described herein is highly dynamic and updating on a regular basis is essential.

Aircraft by themselves are not capable of operations in the Arctic. The environment and navigational procedures make experience in the area necessary for safe and efficient operations. The summary of companies familiar with the conditions and limitations is therefore essential.

2.1 AVAILABLE AIRCRAFT

The aircraft operating in the north are of many sizes and have varying operational capabilities. Table 1 summarizes the characteristics of these aircraft. The various classes of aircraft are grouped, heavy transports first; then medium transports; followed by the light transports. The file number refers to the inventory sheet reference to be included in the Appendix Report. Disposable Weight refers to the poundage available to carry payload and fuel. The runway requirements are for full aircraft operating under Canadian Transport Commission regulations. In actual operations, partial loads can easily be landed on shorter strips. The use of shorter strips is also facilitated by the low temperatures and altitude, two factors which increase air density and thus the lift capability of the wings.

2.1.1 Heavy Transports

There are five types of aircraft operating in the north which could be classified as "Heavy Transports": of these, some operate in freight or mixed passenger/freight configurations while others operate only in the freight configuration.

The Boeing 727 and 737 are jet aircraft capable of landing on gravel strips when specially equipped. They have a shorter range but high speed capability and are operated in mixed configurations.

The Hercules aircraft is the ideal mode for freight because of its large capacity and hatch dimensions combined with long range capability. It has also been used in experimental low altitude drops and is frequently used in the Arctic.

The Lockheed Electra and Douglas DC-6 are smaller aircraft but still perform a satisfactory function as heavy transports over a long range.

2.1.2. Medium Transports

There are five types of medium transports capable of carrying up to 13,500 lbs. for short range flights and up to 1,500 nautical miles with smaller loads. All are operational in the north, although the Buffalo is not available as a commercial craft, but is utilized by the Canadian Armed Forces.

TABLE 1
AIRCRAFT CHARACTERISTICS —
FIXED WING

File No.	Name	Model	Fuel					Consumption gal/hr	Runway Requirements				Under-Carriage Options				Freight		Disposable Weight (lbs.)			
			80/87	100/130	115/145	JP1	JP4		JP5	Normal		Emergency		Wheels	Floats	Skis	Skids	Door Size (in.)		Maximum Package Size (in.)		
										Paved	Gravel	Snow/Ice	Water								Paved	Gravel
HEAVY TRANSPORT																						
A4009	Boeing 727	QC			X	X		1,500	6,000	6,000	6,000		5,000	5,000	5,000		X		134 x 91	230 x 119 x 55	71,221	
A4010	Boeing 737	200			X	X		725	9,000	9,000			6,000	6,000			X		134 x 86	154 x 55 x 83 106 x 86 x 80	56,000	
A4021	Douglas DC6	AB			X			300	5,000	5,000	5,000		4,500	4,500	4,500		X		124 x 78	51 x 10 x 140 51 x 40 x 80	39,500	
A2025	Lockheed Electra	L-188C				X	X	350	5,000	5,000	5,000		3,600	3,600	3,600		X		140 x 78	780 x 32 x 6 51 x 40 x 30	45,500	
A2026	Lockheed Hercules	L100-30				X	X	680	5,000	5,000	5,000		4,000	4,000	4,000		X		120 x 108	552 x 114 x 103	81,435	
MEDIUM TRANSPORT																						
A4012	Bristol Freighter	170						200	3,000	3,000	3,000		1,500	1,500	1,500		X		92 x 76	90 x 75 x 360	16,200	
A4017	De Havilland Buffalo	DHC 5		X		X	X	230	3,000	3,000	3,000		1,500	1,500	1,500		X		92 x 82 84 x 70 Front 84 x 55 Rear	420 x 72 x 40 48 x 56 x 117 24 x 24 x 357	16,000 7,400 Wheels 6,400 Skis	
A4020	Douglas DC-3			X				80	3,400	3,400	5,000		2,500	2,500	3,500		X		90 x 70	216 x 36 x 24	17,500	
A4022	Fairchild (Fokker)	F27, F27Z				X	X	240	4,000	4,000			3,500	3,500			X		48 x 54	336 x 6 x 6 60 x 48 x 42	17,536	
A4023	Hawker HS-748					X	X	210	4,200	4,200	4,200		3,000	3,000	3,000		X		98 x 72	360 x 18 x 6 96 x 96 x 46	20,010	
A4027	Nihon	YS IIA				X	X	330	4,000	4,000	4,000		4,000	4,000	4,000		X					
LIGHT TRANSPORT																						
A4004	Beechcraft	G-18		X				38	2,500	2,500	2,500		1,500	1,500	1,500		X		60 x 38	96 x 18 x 24	3,900	
A4013	Cessna	180, 185		X				12	1,500	1,500	2,000	3,000	1,500	1,500	2,000	3,000		X		38 x 39	78 x 20 x 30	1,400
A4014	Cessna	337G		X				17	3,500	3,500	3,500		1,800	2,000	2,000		X		40 x 37	38 x 35 x 18	1,570	
A4015	Cessna	402, 421		X				36	3,500	3,500	3,500		2,500	2,500	2,500		X		36 x 42	28 x 34 x 34 36 x 23 x 23 76 x 24 x 4	2,250	
A4016	De Havilland Beaver	DHC-2		X				18	1,500	1,500	2,000	3,000	900	900	1,500	2,500		X		40 x 40	46 x 46 x 40 130 x 16 x 24	1,730
A4018	De Havilland Otter	DHC-3		X				30	1,500	1,500	2,500	3,000	800	800	1,500	2,500		X		46 x 45	52 x 48 x 49 215 x 49 x 8	2,600
A4019	De Havilland Twin Otter	DHC6-300			X	X	X	75	2,200	2,200	2,500	3,500	1,000	1,000	1,500	3,000		X		56 x 50	74 x 78 x 60 22 x 72 x 80	5,000
A4028	Short Skyvan	SG-7			X	X		75	2,200	2,200	2,200		1,500	1,500	1,500		X		78 x 78		5,000	

2.1.3 Light Transports

Of the light aircraft only the Twin Otter is used extensively for freight or passenger transport. Its STOL characteristics and high reliability in cold weather make it ideal for application under operational conditions where only short airstrips are available, and maintenance capability is minimal.

2.1.4 Helicopters

Table 2 summarizes the characteristics of the helicopters identified in this project. The range of payloads is smaller and the difference between heavy and medium capacities less distinct with the exception of the Chinook which has a very heavy payload in comparison.

All helicopters normally have sling capabilities for external loads. This permits them to lift large objects including those with awkward shapes.

There are four heavy helicopters capable of transporting between 7,348 and 26,000 lbs. The Puma, the Chinook the Labrador/Voyageur and S61L are used for personnel and freight transport. There are four medium helicopters capable of transporting between 3,512 and 5,800 lbs. All are jet propelled and capable of freight transport internally.

There are six light helicopters capable of lifting between 500 and 2,700 lbs. Only the Bell series 47 are gasoline powered. They are small and are more suitable for use in reconnaissance, not freight transport.

2.2 COMPANIES OPERATING IN THE NORTH

2.2.1 Commercial Operations

The companies operating in the north can be classified according to the type of aircraft they are flying and the areas within which they operate.

Heavy transport is the province of the regional airlines, Northwest Territorial Airlines and the Canadian Armed Forces. Both medium and light transport are usually offered by the smaller firms. Table 3 shows the larger firms and the major equipment which they operate. There are also a large number of local operators who fly small craft which would not have a significant impact on any oil spill clean-up operations from a transport point of view.

The regional carriers operate throughout the north (in their own corridors) to the major centres. The smaller operators are more restricted (because of aircraft range and market conditions) and can be classified as to area of operation as in Table 4.

Helicopters are operated by fewer companies. Okanagan Helicopters is by far the biggest and most experienced operator as shown on Table 5. In general, helicopter operators cannot be as readily identified with an area of operations due to less stringent licencing limits pertaining to operating rights and to the charter nature of this part of the industry. The companies listed in this study have had operations of some kind in the Arctic within the last five years. They are therefore familiar with conditions and limitations of the work environment.

2.2.2 Private Companies

Table 6 lists the corporations which are operating aircraft on a private basis in the Arctic either as owners or lessors. These aircraft are all under Private Register and would not therefore be normally disposable under CTC regulations except for operations carried out by the Company concerned.

TABLE 2
AIRCRAFT CHARACTERISTICS —
HELICOPTER

File No.	Name	Model	Runway Requirements								Under-Carriage Options		Freight		Disposable Weight (lbs.)			
			Normal				Emergency											
			80/87	100/130	115/145	JP1	JP4	JP5	Paved	Gravel	Snow/Ice	Water	Wheels	Floats		Skis	Skids	Door Size (in.)
HEAVY TRANSPORT																		
A4003	Aerospatiale Puma	SA 330J				X	X	153							X	52 x 52	70 x 68 x 160	7,348
A4011	Boeing Vertol*	CH113				X	X	160						X	X	72 x 72	64 x 38 x 72	9,400
A4031	Sikorsky	S61L					X	140						X	X	47 x 64	360 x 6 x 6	8,150
A4033	Boeing Vertol Chinook**	CH147				X	X	325						X	X	90 x 78	366 x 89 x 77	26,000
MEDIUM TRANSPORT																		
A4006	Bell 205/204	A-1				X	X	75						X		90 x 49	90 x 90 x 48 132 x 24 x 24	3,512
A4008	Bell 212	CH-135				X	X	84						X		90 x 49	90 x 90 x 80 132 x 24 x 24	4,459
A4030	Sikorsky	S-58T				X	X	85						X		52 x 48	48 x 48 x 48	5,300
A4032	Sikorsky Sea King	CH-124				X		140						X	X	68 x 60	64 x 58 x 48 360 x 6 x 6	5,800
LIGHT TRANSPORT																		
A4001	Aerospatiale Alouette II	SA-318C				X	X	38						X		42 x 38	72 x 8 x 8	1,680
A4002	Aerospatiale Gazelle	SA-341G				X	X	40						X		57 x 40	48 x 48 x 36	1,574
A4005	Bell 47 Series	G2, G3, G4						18						X		External Racks		900
A4007	Bell 206 Jet Ranger	CH-136					X	25						X	X	35 x 36	45 x 36 x 34	1,259
A4024	Hughes	500-D				X	X	25						X	X	30 x 38		1,380
A4029	Sikorsky	S-55T				X	X	45						X	X	48 x 46	46 x 44 x 38	2,700

*The Boeing Vertol Labrador and Voyageur have similar characteristics

**Data received Feb./78.

TABLE 3
AIRCRAFT BY COMPANIES

TYPE OF TRANSPORT	AIRCRAFT NAME	COMPANIES																TOTAL							
		Canadian Armed Forces	Canadian Coast Guard	Eastern Provincial	Nordair	Northwest Territorial Airlines	Quebecair	Pacific Western Airlines	Transair	Bradley Air	Kenn Borek	Austin Airways	Lambair	Survair	Wardair	Lebrador Airways	Northward		Aklavik	Athabaska	Calm	Contact	Gateway	Norcanair	Trans North Turbo
Heavy	Boeing 727			7	6			3																	
	Boeing 737							13	4																
	Lockheed C130 Hercules	28				1		3																	
	Lockheed Electra		2*		1	2																			
	Douglas DC-6																								
Medium	De Haviland Buffalo	14																							
	Douglas DC-3					4				4	3	6	5	1							1	3	4		
	Fairchild F27										2		1				1								
	Hawker Siddley HS748			1	3		1			4															
	Bristol Freighter																								
	Nihon YS11A								2																
Light	De Haviland Twin Otter	13								8	5	3	4	5	6		3	1	2	4					
	Cessna 185											4					3	2	2	2	4	3	1	1	
	Cessna 337											2					2	2	1	1					
	De Haviland Otter									3		6	2				5	2	1						
	De Haviland Beaver											10					4	2	1						
	Cessna 402									2								2							
	Beechcraft									1															
	Short Skyvan									1										1					
TOTAL		55	2	8	10	7	6	18	6	19	8	33	12	6	7	12	4	6	6	9	4	8	17	6	269

* not available for freight use.

TABLE 4
AREA OF OPERATION OF ARCTIC CARRIERS

A. Western Arctic	D. Hudson Bay/Ungava/Foxe Basin
Pacific Western Airlines	Nordair
Transair	Transair
Northwest Territorial Airlines	Austin Airways
Wardair	Lambair
Kenn Borek Air Services	Survair*
Northward Airlines	Bradley Air Services
	Quebecair (James Bay only)
	Air Inuit**
B. Eastern Arctic	E. Labrador Coast
Transair	Eastern Provincial Airways
Nordair	Labrador Airways
Bradley Air Services	
Kenn Borek Air Services	
Survair	
C. High Arctic	
Pacific Western Airlines	
Nordair	
Transair	
Bradley Air Services	
Kenn Borek Air Services	

*Now in receivership — routes to be taken over by other carrier(s).

**Air Inuit will soon commence service from Fort Chimo on a Class 3 and Class 4 basis.

TABLE 5
HELICOPTERS BY COMPANIES

TYPE OF TRANSPORT	AIRCRAFT NAME	COMPANIES														TOTALS
		Aero Arctic	Apex Helicopter	Bow	Canadian Armed Forces	Canadian Coast Guard	Canadian Helicopter	Klondike Helicopter	Liftair Internat.	Lambair	Nahanni	Okanagan	Trans North Turbo Air	Viking	Heli Voyageur	
Heavy	Sikorsky S61 Boeing Vertol Labrador Boeing Vertol Voyageur Boeing Vertol Chinook (x) Aerospatiale Puma				6 8 8	1					5			1	6 6 8 8 1	
Medium	Sikorsky Sea King Bell 205/204 Bell 212 Sikorsky S58T			2 2	32* 35**		4	2		2	3 6 6		2	1	32 12 47 6	
Light	Bell 47 Series Bell 206 Hughes 500 Aerospatiale Alouette Aerospatiale Gazelle Sikorsky S55T	2 1	4 	9			3 21 3	9	6 2	3 1	1 3	91 15	8 2	3 18	17 6 1	11 164 27 29 2 4
TOTAL		3	4	13	89	32	11	8	4	6	126	10	31	26	363	

* includes those suitable for military use only (16)

** operational status unknown

(x) Data received Feb./78

TABLE 6
OIL COMPANIES OPERATING ARCTIC EQUIPPED AIRCRAFT

1. Amoco Canada Petroleum Ltd. 1212 McKnight Blvd. Calgary, Alberta T2P 2G3 G.A. Fallis Aviation Supt. 403-267-0634	1-HS 748 1-DHC-6 Twin Otter
2. Canadian Superior Oil Ltd. 3 Calgary Place — 355-4th Ave. S.W. Calgary, Alberta T2P 0J3 G.A. Sherley Chief Pilot 403-277-4344	1-DHC 6 Twin Otter
3. Chevron Standard Ltd. 400-5th Ave. S.W. Calgary, Alberta T2P 0L7 R.H. Cull Manager — Aviation 403-267-5910	1-HS 748 2-DHC 6 Twin Otters
4. Dome Petroleum Ltd. Hangar W148, International Airport Calgary, Alberta T2P 2G3 W. (Bud) McMurchy Manager — Aviation 403-276-4478	1-DHC 6 Twin Otter
5. Hudson's Bay Oil & Gas Co. Ltd. Hangar #57 — International Airport Calgary, Alberta T2P 2G3 A.R. Potter Chief Pilot 403-276-2900	1-DHC 6 Twin Otter
6. Imperial Oil Ltd. 11 St. Clair Ave. West Toronto, Ontario M5W 1K3 H.O. Gooding Manager — Air Transport 416-924-9111	1-L188 Electra 3-DHC 6 Twin Otters
7. Mobil Oil Canada Ltd. Box 800 Calgary, Alberta T2P 2J7 L.M. Jones Chief Pilot 403-268-7687	1-Fairchild F27 1-DHC 6 Twin Otter
8. Pacific Petroleums Ltd. Hangar #57 — International Airport Calgary, Alberta T2P 2G3 Gordon F. Davis Manager — Aviation 403-277-4244	1-DHC 6 Twin Otter
9. Panarctic Oils Ltd. P.O. Box 190 Calgary, Alberta T2P 2H6 H.J. Strain Vice-President, Transportation 403-269-0311	2-DHC 6 Twin Otters
10. Petro-Canada Exploration Inc. Hangar #57, International Airport Calgary, Alberta T2P 2G3 R.J. Austin Chief Pilot 403-277-0293	1-DHC 6 Twin Otter
11. Shell Canada Resources Ltd. Hangar W148, International Airport Calgary, Alberta T2P 2G3 J.F.M. Stuart Aviation Manager 403-276-8445	1-Fairchild F27 2-DHC 6 Twin Otters

2.3 OPERATIONAL AIRSTRIPS

A total of 89 airstrips have been identified which are of importance in the event of an oil spill cleanup operation. Of these, four are inland and would be used as supply bases only. The size and sophistication of the facilities varies from negligible in the abandoned sites to full in the larger centres. Table 7 summarizes operational characteristics of the various airports. In this section, the regions defined in the Introduction will be used to summarize the location. There are two main parameters which define the value of an airstrip; location and function.

The airport function is defined by the following classification:

- **Major Community** — The airstrip serves a major community which also often acts as a distribution centre for a particular area. The facilities are generally of a high quality including longer than average runways and better than average navigational equipment. There is normally a significant number of regularly scheduled flights and most services are available.
- **Work Site** — The airstrip serves a mine, oil or gas exploration site which is not also a native settlement. The operator is usually a private corporation and the facilities are often of a temporary nature.
- **Minor Community** — The airport serves a minor community which is not served by a regularly scheduled carrier on a frequent basis. The runways are usually shorter than average and flight approach instrumentation is minimal.
- **Weather Station** — An airstrip established by the Department of Transport primarily to serve a weather station.
- **Military (Active)** — The airstrip is used by the United States Air Force or Canadian Armed Forces for military purposes (as DEW Line site or Coast Guard Station, for example). The strip is operational and manned year round.
- **Abandoned** — These are sites which have operational status on an emergency basis for V.F.R. only. These sites have runways and shelter is often available in abandoned buildings.

Table 8 summarizes the sites according to these two classification parameters (location and function).

A total of 85 airstrips have been identified as being of operational value. Of these, 25 are in the Western Arctic, 10 are in the Eastern Arctic, 19 are in the High Arctic, 29 are in Hudson Bay/Ungava/Foxe Basin and 2 are on the Labrador Coast.

A recent press release by the Ministry of Transport indicated that four airports in Labrador will be significantly upgraded and improved this year. The airports are at Nain, Rigolet, Cartwright and Makkovik. The availability of these airports will greatly improve the operational capability to combat an oil spill in the region of the Labrador coast.

There are a total of 15 major community airstrips, 16 work sites, 30 minor community sites, 3 weather stations, 15 active military sites and 6 abandoned sites. The number of major and minor community airstrips will not change very suddenly, but the work sites can be abandoned on short notice and their operational status could be questionable at any given time.

File No.	Name	Coordinates		Runway						Navigation Aids										Fuel Available				Services				Accessibility			
		N	W	All Season	All Weather	Length	Snow/Ice	Water	Gravel	Asphalt	VOR	Tacan	NDB	VDF	VHF	UHF	ILS	VFR	100	115	JP4	Min. Main.	Min. Repair	Maj. Repair	Unload Equip.	Hangar Space	Port	Community	Winter Road	All Weather	
A2001	Aklavik	68°13'	135°00'	x		2,400		x										x	x	x								x			x
A2004	Atkinson Point	69°56'	131°25'			2,500		x																							
A2006	Bathurst Inlet	66°51'	108°08'			3,500		x																							
A2011	Byron Bay	68°45'	109°04'			4,500									x																
A2012	Cambridge Bay	69°06'	105°08'			5,000									x																
A2020	Cape Perry	70°10'	124°42'			5,000									x																
A2021	Cape Young	68°56'	116°56'			4,660									x																
A2022	Clinton Point	69°35'	120°44'			4,500									x																
A2026	Coppermine	67°49'	115°08'			5,000									x																
A2036	Gjoa Haven	68°38'	95°53'			3,000									x																
A2037	Gladman Point	68°40'	97°48'			4,700									x																
A2040	Hay River	60°50'	115°47'			6,000									x																
A2041	Holman Island	70°44'	117°47'			3,400									x																
A2044	Inuvik	68°18'	133°43'			6,000									x																
A2047	Jenny Island Island	68°39'	101°44'			4,500									x																
A2048	Johnson Point	72°46'	118°30'			5,400									x																
A2052	Komakuk Beach	69°36'	140°10'			3,500									x																
A2053	Lady Franklin Point	68°29'	113°13'			4,500									x																
A2061	Nicholson Peninsula	69°57'	128°54'			3,550									x																
A2062	Norman Wells	65°17'	126°48'			6,000									x																
A2065	Paulatuk	69°21'	124°05'			3,200									x																
A2077	Sachs Harbour	72°00'	125°15'			4,000									x																
A2078	Shepherd Bay	68°48'	93°25'			4,500									x																
A2080	Shingle Point	68°56'	137°14'			3,785									x																
A2083	Spence Bay	69°32'	93°32'			2,800									x																
A2085	Tuktoyaktuk	69°26'	133°07'			3,522									x																
A2088	Whitehorse	60°43'	135°04'			7,200									x																
A2089	Yellowknife	62°28'	114°25'			7,500									x																

[illegible]

[illegible]

HUDSON BAY/UNGAVA/FOX E BASIN

TABLE 7E
AIRPORT OPERATIONAL CHARACTERISTICS
LABRADOR COAST

File No.	Name	Coordinates		Runway	Navigation Aids		Fuel Available		Services		Accessibility	
		N	W									
A2035 A2081	Goose Bay Saglek	53° 19'	60° 26'	Length			11,050 4,760					
		58° 28'	62° 39'									
				Snow/Ice								
				Water								
				Gravel								
				Asphalt								
				All Season								
				All Weather								
				VOR								
				Tacan								
				NDB								
				VDF								
				VHF								
				UHF								
				ILS								
				VFR								
				100								
				115								
				JP1								
				JP4								
				Min. Main.								
				Min. Repair								
				Maj. Repair								
				Unload Equip.								
				Hangar Space								
				Port								
				Community								
				Winter Road								
				All Weather								

TABLE 8
AIRPORTS BY LOCATION AND CLASSIFICATION

<i>A. WESTERN ARCTIC</i>		
Major Community	Minor Community	Military — Active
Cambridge Bay (DEW)	Bathurst Inlet	Byron Bay
Coppermine	Gjoa Haven	Cambridge Bay
Inuvik	Holman Island	Cape Parry
Norman Wells	Paulatuk	Cape Young
Yellowknife	Sachs Harbour	Clinton Point
Whitehorse	Spence Bay	Gladman Point
Aklavik	Tuktoyaktuk (DEW)	Jenny Lind Island
Hay River		Komakuk Beach
		Lady Franklin Point
		Nicholson Peninsula
		Shepherd Bay
		Shingle Point
		Tuktoyaktuk
Work Site	Weather Station	Abandoned
Johnson Point	Nil	Atkinson Point
<i>B. EASTERN ARCTIC</i>		
Major Community	Minor Community	Military — Active
Frobisher Bay	Broughton Island (DEW)	Broughton Island
	Clyde River	Cape Dyer
	Pangnirtung	Cape Hooper
	Pond Inlet	
	Arctic Bay	
Work Site	Weather Station	Abandoned
Nanisivik	Nil	Brevoort Island
		Cape Christian
<i>C. HIGH ARCTIC</i>		
Major Community	Minor Community	Military — Active
Resolute Bay	Alert (Weather)	Nil
	Grise Fiord	
Work Site	Weather Station	Abandoned
Beverly Inlet	Alert	Cape O'Brien
Cameron Island	Eureka	
Cape Allison	Isachsen	
Depot Island	Mould Bay	
Drake Point		
King Christian Island		
King Point		
Malloch Dome		
Rea Point		
Roche Point		
Sherrard Bay		
Sophie Point		

TABLE 8 (Continued)
D. HUDSON BAY/UNGAVA/FOX E BASIN

Major Community	Minor Community	Military — Active
Baker Lake Churchill Coral Harbour Eskimo Point Fort Chimo Moosonee Rankin Inlet	Cape Dorset Chesterfield Inlet Hall Beach (DEW) Igloodik Inoucdjouac Invujivik Koartac Lake Harbour Payne Bay Pelly Bay (DEW) Poste de la Baleine Povungnituk Repulse Bay Sugluk Wakeham Bay Whale Cove	Hall Beach Longstaff Bluff Mackar Inlet Pelly Bay
Work Site		Abandoned
Deception Bay		Bray Island Resolution Island Rowley Island
Weather Station		
Nil		
<i>E. LABRADOR COAST</i>		
Major Community	Minor Community	Military — Active
Goose Bay/Happy Valley	Nil	Nil
Work Site	Weather Station	Abandoned
Saglek (Abandoned radar site)	Nil	Saglek

2.4 SOURCES AND CONTACTS

Canadian Armed Forces — Domestic Operations Section

Major R. Paukstaitis
12 Center Block South — 101 Col. By Drive, Ottawa
613-992-3265

Bradley Air Services Limited

Richard M. deBlicquy — Vice-President
Carp, Ontario, K0A 1L0
613-839-3340

Okanagan/Universal Helicopters

G.H. Johnston — Vice-President
Carp, Ontario
613-839-3201

Canadian Aeronautical Publications: — All current issues

VRF Chart Supplement
IFR Supplement
Northern Supplement
Canadian Air Pilot — West and East

Jane's Commercial Transport Aircraft 1975

Canadian Aviation Directory — 1977

Arctic Digest — Directory — 1977

Flight Manuals of Various Aircraft

Aero Arctic Ltd.

R.W.T. O'Connor — President
P.O. Box 1496
403-873-5230

Northwest Territorial Airways Ltd.

R.P. Engle — President
Postal Service 900, Yellowknife
403-873-4477

Pacific Western Airlines

A.J. Moule, Vice-President — Contract & Charter
700-2nd Street S.W., Calgary
403-261-7760

2.5 UPDATING

Airstrips

The airstrip data are extremely vulnerable to change. New airstrips are being constructed and others abandoned on a week to week basis, closely following the level of exploration and drilling activity. In the context of a possible oil spill, sources for the most up-to-date information are vital.

The best source for current airstrip data would be Pacific Western Airlines, Hercules Operations Division, Edmonton, Alberta. Phone 403-455-4101. They offer a subscription service for Arctic airstrip data at a cost of \$250 per month.

Secondary sources include locally based air services in the appropriate area, oil companies and various Government Departments such as the Canadian Armed Forces, Royal Canadian Mounted Police and the Land Use Agencies.

Air Carriers

Changes in Companies and their bases of operation are relatively stable and can be verified by contacting the sources listed above.

Aircraft

Significant changes or advancements in the type of aircraft and helicopters available are relatively infrequent and can be determined by reference to the latest Canadian Aviation Directory.

2.6 SPECIAL TECHNOLOGY AND FUTURE DEVELOPMENTS

ParaDrop

Significant advances have been made in recent years in the accuracy and reliability of this method of cargo delivery. The Canadian Armed Forces advise that they can handle a single unit drop of 35,000 lbs., using a C130 Hercules with suitable packaging. A case of eggs can be delivered without breakage. This system would be very effective for a fast response in an oil spill situation on land or sea ice, and possibly even for containment systems in the case of a sea spill.

Lapes — Low Altitude Parachute Extraction System

Cargo may be delivered with pinpoint accuracy by this technique. It involves an aircraft such as a C130 Hercules with a rear cargo ramp, flying at about 10 feet over the drop zone (which must be fairly smooth) and deploying a parachute to extract the load. Military hardware such as tanks, ammunition and fuel drums have been delivered by this method, although with significant spoilage.

Future

Only minor advances are to be expected in the size and cargo capability of transport aircraft and helicopters. These advances will probably be in the military inventory initially. The DeHavilland Dash 7 Medium Transport (10,000 lbs. payload), with good STOL performance, will enter service next year. It may be available in an Arctic Carrier's fleet (Wardair). Unfortunately it does not feature a rear cargo door and suffers a handicap for loading large packages, and ease of loading/unloading.

Navigational aids are improving steadily, with many aircraft from Twin Otters up being equipped with on-board very low frequency area navigation systems. Introduction of the Navstar Satellite Navigation System in the early 1980's should have a major impact on Arctic navigation and bad weather landing capability.

Air Canada's recent takeover bid for Nordair could have an impact on the equipment available and quantity of service.

3.0 SUMMARY OF MARINE SYSTEM

3.1 AVAILABLE VESSELS

Vessels that have been involved in arctic re-supply at any time since 1970 are listed in Table 9. Table 10 gives the operational characteristics of the vessels which have been included in this survey. Some vessels listed in Table 9 do not appear in Table 10, because they have been taken out of service, are unstrengthened or are otherwise not available for future work in the Arctic.

The displacement is the weight of water which a vessel displaces when fully loaded, an important consideration when ice breaking potential is required. The deadweight is a measurement of a ship's tonnage which indicates the carrying capacity of a ship in tons weight*.

The draft is the distance from the water line to the lowest point on the keel for a laden ship in calm water. The largest hatch dimension reflects the size of package which might be accepted as well as the possibility of landing aircraft upon the deck.

There are two systems of classifying ships according to their capability in ice; Lloyds Registry and the Canadian Ice Classification. Lloyds system varies from 1* as a strengthened merchant to the less strengthened 2, 3 and 4 classes. An unstrengthened vessel is not classed. The equivalents to these ratings in the Canadian Ice Classification are A, B, C, D and E.

This system also classes icebreakers according to the number of feet of ice through which they can proceed at a constant rate.

No attempt has been made to include those vessels trading into the Port of Churchill for the following reasons: These voyages are made on a 'one off' basis (i.e. a voyage charter) and are not, except in rare cases, repeated. Further, the vessels employed in this trade are not strengthened for navigation on ice.

3.2 GOVERNMENT AGENCIES AND COMPANIES OPERATING IN THE NORTH

The government agencies that are closely associated with shipping in the Canadian Arctic are identified in Table 11. The shipping companies are identified by the type of vessel they operate.

3.3 PORTS AND ANCHORAGES

On Table 12 the ports and anchorages have been discussed under the same five regional headings as identified in the Introduction to this report. The ports have been divided into five categories and an evaluation of the quality of shelter offered and anchorage is provided.

3.3.1 Categories of Ports and Anchorages

The following five categories have been adopted:

Major Settlements — Those which serve, among other things, as redistribution ports for smaller settlements and commercial developments. An example is Resolute Bay.

Minor Settlements — Those which are traditionally re-supplied each summer by sealift, e.g. Pond Inlet.

Commercial Sites — Serving those commercial activities engaged in mining or the search for oil and gas, e.g. Rea Point or Nanisivik.

Abandoned Settlements

*Anchorage*s

*Tonnage is in terms of the metric ton of 2,205 lbs. or 1,000 kilograms. Slight errors may occur since many original registrations were in Avoirdupois tons (2,240 lbs) which is 1.6% heavier.

TABLE 9
VESSELS ENGAGED IN ARCTIC RESUPPLY BY YEAR

CLASS	VESSEL NAME	YEAR							
		70	71	72	73	74	75	76	77
Motor Tanker	Cabatern (U/S)		✓						
	Edouard Simard		✓						✓
	Esso Bahamas				✓			✓	
	Frobisher Transport					✓			✓
	Imperial Acadia					✓			
	Imperial Bedford		✓		✓	✓	✓	✓	✓
	Imperial St. Clair						✓		
	James Transport			✓					
	Jos Simard	✓	✓	✓	✓	✓	✓	✓	✓
	Leon Simard								✓
	Ludger Simard								✓
	Lunni								✓
	Maplebranch	✓	✓	✓	✓		✓		✓
	Palva			✓	✓				✓
	Sea Transport	✓				✓			
	Wilke (1)				✓	✓	✓		
Motor Vessel	Andrew C. Crosbie		✓		✓	✓		✓	
	Arctic Trader								✓
	Bill Crosbie		✓	✓	✓	✓	✓	✓	✓
	Calanus (U/S)				✓		✓	✓	
	Carino					✓			
	Chesley A. Crosbie		✓		✓	✓		✓	✓
	Chimo			✓					
	City of Corinth						✓		
	Conrad Marie			✓					
	C.P. Edwards*							✓	
	Edgar Jourdain								✓
	Eskimo (U/S)			✓			✓		✓
	Federal Hudson*		✓	✓					
	Finnmaster					✓			
	Fort Chambly (U/S)		✓						
	Fort Gaspé (U/S)							✓	
	Fort George (U/S)			✓					
	Fort Kent (U/S)			✓				✓	
	Fort Lennox			✓				✓	✓
	Fort Lewis (U/S)			✓					✓
	George Crosbie*				✓		✓	✓	
	Global Envoy*	✓	✓						
	Helga Dan*			✓	✓				
	Inland			✓					
	Kawaki*					✓			
	Lorna P.			✓					
	Maloize			✓					
	Maridan C. (U/S)			✓			✓		✓

(Continued)

TABLE 9 (cont'd)
VESSELS ENGAGED IN ARCTIC RESUPPLY BY YEAR

CLASS	VESSEL NAME	YEAR							
		70	71	72	73	74	75	76	77
Motor Vessel	Maurice Desgagnes (U/S)								✓
	Messiniaki (1)			✓					
	Orion Arctic				✓				
	Percy M. Crosbie (3)			✓	✓				
	Polar Bjorn*						✓		
	Sable Ferry (U/S)			✓					
	Salerno*				✓	✓			
	Sir John Crosbie		✓	✓	✓	✓	✓	✓	
	Tavastland*			✓					
	Thebeland*				✓				
	Theta							✓	
	Thora Dan*			✓	✓				
	Tundraland				✓	✓			
	Twillingate*		✓						
Voyageur D.*		✓							
Steam Tanker	Esso Penang		✓						
Tug	Foundation Vigilant			✓					
	Point Valiant						✓		
Government Fleet									
Heavy Icebreaker (2)	d'Iberville								
	John A. MacDonald								
	Labrador								
	Louis S. St. Laurent								
	N.B. McLean								
	Norman McLeod Rogers								
Heavy Icebreaker /Cable Repair (2)	John Cabot								
Medium Icebreaker /Navais Tender (2)	Camsell								
	Griffon								
	J.E. Bernier								
	Montcalm								
	Sir Humphrey Gilbert								
	Sir William Alexander								
	Wolfe								
Northern Service Vessel (2)	Narwhal								
Oceanographic/ Survey/Icebreaker	Baffin								
	Hudson								

*These vessels have been taken out of service, sold, broken up or otherwise proved to be untraceable via Lloyd's lists.

(1) Imperial Oil Limited Charter

(2) Canadian Coast Guard Service

(3) Canadian National Railway Charter

(U/S) Unstrengthened Vessel

TABLE 10A
MARINE VESSEL OPERATIONAL CHARACTERISTICS FOR TUGS

File Number	Name	Call-sign	Type	Displacement (tons)	Deadweight (tons)	Length (ft)	Draft (ft)	Largest Hatch Cover (ft)	Helo Capable	Cranes or Derricks
M9002	Angus Sherwood		RT		668.8	160	5.5		*	
M9018	Canmar Supplier		IT/SS	1188	995	208	15		Yes	Yes
M9019	Canmar Supplier II		IT/SS	1192	1016	210	15		Yes	
M9020	Canmar Supplier III		IT/SS	1190	1042	210	15		Yes	
M9021	Canmar Supplier IV	GOFH	IT/SS	1190	1032	210	15		Yes	
M9036	Englishman		RT		574	44.71	6.71			
M9047	Henry Christofferson		RT		783.2	148.4	3.75			
M9048	Horn River		RT		107.7	80.2	2.75			
M9052	Jock McIniven		RT		776.9	148.3	3.75			No
M9055	Johnny Hope		RT		783.0	148.3	3.75			No
M9057	Kakisa		RT		203.6	83	3			
M9058	Kelly Hall		RT		669.1	160	5.5			No
M9060	Knut Lang		RT		788.7	167.6	5.5			No
M9063	Lister		RT		117.2	72	4			
M9068	Matt Berry		RT		776.9	148.3	3.75			No
M9073	Niangua		RT		21	39.4	3			
M9075	NT Husky		RT		288.2	122	5			
M9076	NT Marjory		RT		160.1	74	3.5			
M9077	NT Pelican Rapids		RT		163.5	98.2	3.5			
M9080	Peace		RT		95	73.7	2.5			
M9082	Radium Charles		RT		230.1	111.3	4			
M9083	Radium Dew		RT		289.0	120	5			
M9084	Radium Express		RT		88	72	3			
M9085	Radium Franklin		RT		102.6	60	2			
M9086	Radium Gilbert		RT		296.8	113.3	5			
M9087	Radium Miner		RT		199.8	95	2.8			
M9088	Radium Prospector		RT		198.8	95	2.8			
M9089	Radium Scout		RT		73.6	67.3	2			
M9090	Radium Trader		RT		199.8	95	2.8			
M9091	Radium Yellowknife		RT		235.5	120	4			
M9096	Thruster I		RT		213.5	102.8	3.6			
M9097	Thruster II		RT		213.5	102.8	3.5			
M9098	Thruster III		RT		213.5	102.8	3.5			
M9099	Thruster IV		RT		213.5	102.8	3.5			
M9102	Vic Ingraham		RT		711.2	149.6	3.75			
M9103	Watson Lake		RT		63.4	74.9	2.25			No

RT — River Tug IT/SS — Icebreaking Tug/Supply Ship * —Possible to sling loads off after deck by helicopter.

TABLE 10B
MARINE VESSEL OPERATIONAL CHARACTERISTICS FOR
MERCHANT GENERALS

File Number	Name	Call-sign	Type	Displacement (tons)	Deadweight (tons)	Length (ft)	Draft (ft)	Largest Hatch Cover (ft)	Helo Capable	Cranes or Derricks
M9001	Andrew C. Crosbie	VGLC	MG		3,491	320	18	20 x 70	No	Yes
M9008	Banksland	VGTF	MB		509.8	166	7			
M9009	Bill Crosbie	VC7277	MG		2,520	290	18	28 x 40	No	Yes
M9014	Canmar Carrier	VODC	MB		24,011	608	34	40 x 42		Yes
M9024	Chesley Crosbie	VGOB	MG		2,008	253	16	20 x 70	No	Yes*
M9033	City of Corinth	GRYS	MG		2,416	93.8	5.1	7 x 19		Yes
M9039	Finnmaster	OIAO	MG		6,014	106.6	9.0	10.5 x 27.4		Yes
M9040	Fort Lauzon	VCXG	MG		1,778	217	15	20 x 35		Yes
M9041	Fort Ramezay	CYFP	MG		1,778	217	15	15 x 62		Yes
M9042	Fort St. Louis	CYMS	MG		8,499	466	25	26.5 x 54		
M9043	Frank Broderick	VCYG	MG	1.818	1,212	230	10	17 x 30		
M9044	Frank H. Brown	VGTD	MC		7,011	120.1	6.1	17.5 x 18.2		Yes
M9059	Klondike	VCGW	MC		7,011	120.1	6.1	17.5 x 18.2		Yes
M9078	Orion Arctic	MF	MF		886	57.9	4.4			
M9094	Sir John Crosbie	VOTF	MG		2,175	253	20	20 x 70	No	Yes
M9100	Tundraland	GUDN	MG		4,572	391	21	17 x 33	No	Yes
**M9106	Chimo	VGKO	MG		7,920	143.6	7.2	16.7 x 7.7		Yes
**M9107	Edgar Jourdain	VYWD	MG		1,781	240	16	5.7 x 5.9		Yes
**M9108	Fort Lennox	VDZW	MG		1,178	332	15	4.8 x 9.1		
**M9112	Theta	VC2525	MG		571	183	13	5 x 2.4		

MG — Merchant General
MB — Merchant Bulk
MC — Merchant Container

MF — Merchant Fishing

* — Possible to install flight deck on stern.

** — Data received Feb./78

TABLE 10C
MARINE VESSEL OPERATIONAL CHARACTERISTICS FOR
TANKERS

File Number	Name	Call-sign	Type	Displacement (tons)	Deadweight (tons)	Length (ft)	Draft (ft)	Largest Hatch Cover (ft)	Helo Capable	Cranes or Derricks
M9003	Arctic Trader	VXMM	T		4,431	96.02	6.19			Yes
M9004	Arsene Simard	VCGZ	T		8,332	433	22			Yes
M9005	Arthur Simard	VGDK	T		9,178	433	22			
M9007	Baffin Transport	VGLM	T	10,797		529	38			Yes
M9023	Chemical Transport	VYRF	T	4,981		391	27.5			Yes
M9035	Edouard Simard	CYCJ	T		7,287	127.7	6.84			
M9037	Esso Bahamas	YZBN	T		31,110	569.2	11.27			
M9038	Esso Penang	HOJZ	T		21,457	557.7	9.4			Yes
M9045	Frobisher Transport	VGBK	T	5,650		463	30.5			Yes
M9050	James Transport	VGGB	T	4,699		371.5	27.5			Yes
M9056	Jos Simard	VGZX	T		7,268	410	22			
M9062	Leon Simard	VGKL	T		9,178	433	21			Yes
M9065	Ludger Simard	VYJZ	T		7,175	412	23			Yes
M9066	Lunni	OJHM	T		16,000	162.0	9.5			
M9067	Maplebranch	VGCD	T		6,518	460	24			No
M9069	Messiniaki	SYHI	T		30,243	170.8	11.01			Yes
M9079	Palva	OGJU	T		16,515	164	9.2			Yes
M9081	Pinnebog		T		2,782	310.9	18			
M9092	Sea Transport	VCDK	T	3,971		366.6	27			Yes
M9101	Ungava Transport	VGFN	T	5,117		403.5	28.5			
M9104	Wilke	OIAD	T		25,633	175.1	9.7			
**M9109	Imperial Acadia	VGFD	T		10,475	134.2	7.7			
**M9110	Imperial Bedford	VYQT	T		14,204	148.2	7.9			
**M9111	Imperial St. Clair	VGQJ	T		12,708	132.6	7.8			

**Data received Feb./78

TABLE 10D
MARINE VESSEL OPERATIONAL CHARACTERISTICS FOR ICEBREAKERS

File Number	Name	Call-sign	Type	Displacement (tons)	Deadweight (tons)	Length (ft)	Draft (ft)	Largest Hatch Cover (ft)	Helo Capable	Cranes or Derricks
M9006	Baffin	CGCL	O/S/I	3,460		285.5	18.7		Yes	
M9010	Camsell	CGCW	MI/NT	3,100	1,050	223	16	14 x 18.5	Yes	Yes
M9022	Carino	VXZM	S		597	144.7	16.7	3 x 4.8	Yes	
M9034	D'Iberville	CGSM	HI	9,930		310	26	13 x 14	Yes	Yes
M9046	Griffon	CGDS	MI/NT	2,944	744	234	15.5	14 x 20	Yes	Yes
M9049	Hudson	CGDG	O/S/I	3,721	1,168	300	25		Yes	Yes
M9051	J. E. Bernier	CGBT	MI/NT	3,100	825	231	16.3	10 x 18	Yes	Yes
M9053	John A. MacDonald	CGBK	HI	9,160	3,685	315	29	14 x 14.8	Yes	Yes
M9054	John Cabot	CGDJ	HI/CS	6,400		313	22		Yes*	Yes
M9061	Labrador	CGGM	HI	6,940		269	30.17	10 x 15	Yes	Yes
M9064	Louis S. St. Laurent	CGBN	HI	14,280L/T	4,644 L/T	366.5	31	10 x 15	Yes	Yes
M9070	Montcalm	CGBB	MI/NT	2,017	838	220	16.3	11 x 18	Yes	Yes
M9072	N. B. McLean	CGSN	HI	3,254	1,880	257	19.5		Yes	
M9074	Norman McLeod Rogers	CGBZ	HI	6,404	2,320	295	20	10 x 20	Yes	Yes
M9093	Sir Humphry Gilbert	CGGN	MI/NT	3,005	1,100	220	16.3	14 x 18.6	Yes	Yes
M9095	Sir William Alexander	CGGF	MI/NT	3,550	1,550	272	17.5	10 x 15	Yes	Yes
M9105	Wolfe	CFCT	MI/NT	2,995	1,016	252	16.3		Yes	Yes

O/S/I — Oceanographic/Survey/Icebreaker
MI/NT — Medium Icebreaker/Naval's Tender
S — Surveyor
L/T — Long Tons
HI — Heavy Icebreaker
HI/CS — Heavy Icebreaker/Cable Ship
* — Flightdeck is often obstructed by installation of Cable Plough.

TABLE 10E
MARINE VESSEL OPERATIONAL CHARACTERISTICS FOR MISCELLANEOUS SHIPS

File Number	Name	Call-sign	Type	Displacement (tons)	Deadweight (tons)	Length (ft)	Draft (ft)	Largest Hatch Cover (ft)	Helo Capable	Cranes or Derricks
M9011	Canmar Barge		TB	1789		225	10	65 x 225		
M9012	Canmar Barge II		TB	956		216	10	52 x 216		
M9013	Canmar Barge III		TB	1975		216	10	52 x 216		
M9015	Canmar Explorer		D	4000		375	30		Yes	Yes
M9016	Canmar Explorer II		D	6041		375	30		Yes	Yes
M9017	Canmar Explorer III		D	10374	7434	500	25		Yes	Yes
M9025	Chimo No. 14		SS		28	40		28 x 28	Yes*	
M9026	Chimo No. 15		SS		28	40		30 x 40	Yes*	
M9027	Chimo No. 17		SS		28	40		30 x 40	Yes*	
M9028	Chimo No. 18		SS		28	40		30 x 40	Yes*	
M9029	Chimo No. 20		SS		28	40		30 x 40	Yes*	
M9030	Chimo No. 21		SS		28	40		30 x 40	Yes*	
M9031	Chimo No. 22		SS		7	31		30 x 31	Yes*	
M9032	Chimo No. 23		SS		7	31		20 x 31	Yes*	
M9071	Narwhal	CGBP	NSV	2222	1118	251.5	12.9	10 x 18		Yes

TB — Tank Barge
D — Drill Ship
SS — Steel Scow
NSV — Northern Service Vessel
* — Possible to use as a helicopter platform.

TABLE 11
AGENCIES AND COMPANIES OPERATING IN THE ARCTIC

Government of Canada

The Commissioner,
Canadian Coast Guard
Tower 'A', Place de Ville
Ottawa, Ontario

The Director,
Coast Guard Fleet Systems
Tower 'A', 7th Floor
Place de Ville
Ottawa, Ontario

The Dominion Hydrographer
615 Booth Street
Ottawa, Ontario

**Companies Operating
Merchant Tankers**

Branchlines
101 Montcalm Street
St. Joseph de Sorel
Quebec

Hall Shipping Corporation
4333 St. Catherine Street W.
Montreal, Quebec

Imperial Oil Ltd.
111 St. Clair Avenue W.
Toronto, Ontario

**Companies Operating
Merchant Generals**

Agence Maritime
P.O. Box 156, Station 'B'
Quebec City, Quebec

Burnett Chapman Ship Management
'D' Floor
Millburn House
Newcastle-upon-Tyne
England

Chimo Shipping Ltd.
P.O. Box 398
St. John's, Newfoundland

Canada Steamship Lines
P.O. Box 100
759 Victoria Square
Montreal, Quebec

FEDNAV
Stock Exchange Tower
Victoria Square
Montreal, Quebec

**Companies Operating
Merchant Bulk Carriers**

Canadian Marine Drilling
c/o Dome Petroleum
Winnipeg, Manitoba

Northern Transportation Co. Ltd.
9945-108 Street
Edmonton, Alberta

**Companies Operating Offshore
Supply/Rig, Supply River Tugs &
Drill Rigs**

Canadian Marine Drilling
c/o Dome Petroleum
Winnipeg, Manitoba

Canadian Offshore Marine
P.O. Box 9
Halifax, Nova Scotia

FEDNAV
Stock Exchange Tower
Victoria Square
Montreal, Quebec

Northern Transportation Co. Ltd.
9945-108 Street
Edmonton, Alberta

TABLE 12A
PORTS & ANCHORAGES IN THE ARCTIC BY LOCATION
WESTERN ARCTIC

Name	Category	Pollution Control Zone	Chart #	Days of Nav. Season (1)	Duration in (2)	Degree of Shelter Afforded (Good/Bad or Acceptable)	Anchorage (Sat or Unsat)	Ship/Shore Communications
Bay Chimo	Minor	11	7628	163	77	Good	Sat	No
Bernard Hbr	Abandoned	11	7676/7670	163	77	Bad	Unsat	No
Cambridge Bay	Major	11	7697/7619	163	77	Acceptable	Sat	Yes
Cape Parry	Abandoned	12	7637/7611	184	112	Good	Sat	No
Cape Young	Minor (Military)	11	7646	163	77	Bad	Unsat	No data
Coppermine	Minor	11	7678/7617,7082	163	77	Bad	Sat	No data
DeSalls Bay	Anchorage	11	7631	163	77	Acceptable	Sat	No
Gloa Haven	Minor	7	7760	148	51	Good	Sat	No
Herschel Is.	Abandoned	12	7603	184	112	Acceptable	Unsat	No
Holman	Minor	11	7658	163	77	Acceptable	Unsat	No
Jenny Lind Bay	Minor (Military)	7	7646/7083	148	51	Acceptable	Sat	No
Komakuk Beach	Minor (Military)	12	7622	184	112	Bad	Unsat	No data
Lady Franklin Point	Minor (Military)	7	7646/7670	163	77	Bad	Sat	No data
McClintock Bay	Minor (Military)	12	7735/7083	148	51	Acceptable	Sat	No data
Nicholson Pen.	Minor (Military)	12	7622/7606	184	112	Acceptable	Sat	Yes
Paiutuk	Minor	12	7640	184	112	Acceptable	Sat	No
Pearce Pt. Hbr	Abandoned (Military)	12	7630	184	112	Acceptable	Unsat	Yes
Police Point	Minor (Military)	12	7630	163	77	Acceptable	Sat	No
Reed Island	Abandoned	11	7671/7616	184	112	Bad	Unsat	No
Sachs Harbour	Minor	12	7630	163	77	Acceptable	Sat	No
Shepherd Bay	Minor (Military)	7	7646/7760	148	51	Acceptable	Sat	No data
Sindair Creek	Minor (Military)	11	7646/7618	163	77	Bad	Unsat	No data
Spence Bay	Minor	7	7770	148	51	Acceptable	Unsat	No
Tuktoyaktuk	Major	12	7625	184	112	Good (but shallow)	Sat	Yes
Tysoe Point	Minor (Military)	11	7630	163	77	Bad	Sat	No data

(1) Based on an Icebreaker (Arctic Class 3).

(2) Based on an unstrengthened vessel.

TABLE 12B
PORTS & ANCHORAGES IN THE ARCTIC BY LOCATION
EASTERN ARCTIC

Name	Category	Pollution Control Zone	Chart #	Duration in Days of Nav. Season		Degree of Shelter Afforded (Good/Bad or Acceptable)	Anchorage (Sat or Unsat)	Ship/Shore Communications
				(1)	(2)			
Arctic Bay	Minor	13	7282	204	36	Good	Sat	No
Brevort Harbour	Abandoned	15	7135	225	108	Acceptable	Sat	No
Broughton Island	Minor	9	7184	174	56	Acceptable	Sat	Yes
Cape Hooper	Minor	9	7193	174	56	Good	Sat	No
Clyde River	Minor	9	7225,7053	174	56	Good	Sat	No
Fort Ross	Abandoned	6	7251,7550	112	No Entry	Acceptable	Unsat	No
Frobisher Bay	Major	15	7127,7122,7125	225	108	Bad	Sat	Yes
Nanisivik	Minor	13	7282	204	36	Good	Sat*	Yes
Padloping	Minor	9	7180	174	56	Bad	Unsat	No data
Pangnirtung	Minor	10	7150	194	71	Acceptable	Sat	No
Pond Inlet	Minor	13	7250,7055	204	23	Acceptable	Sat	No

*The only Eastern Arctic settlement where vessels can berth alongside in deep water.

(1) Based on an icebreaker (Arctic Class 3).

(2) Based on an unstrengthened vessel.

TABLE 12C
PORTS & ANCHORAGES IN THE ARCTIC BY LOCATION
HIGH ARCTIC

Name	Category	Pollution Control Zone	Chart #	Duration in Days of Nav. Season		Degree of Shelter Afforded (Good/Bad or Acceptable)	Anchorage (Sat or Unsat)	Ship/Shore Communications
				(1)	(2)			
Craig Harbour	Abandoned	6	7330	112	No Entry	Bad	Unsat	No
Dundas Harbour	Abandoned	13	7282	204	36	Good	Sat	No
Eureka	Minor	3	7920	82	No Entry	Acceptable	Sat	No
Gracier Fiord	Anchorage	3	7920	82	No Entry	Acceptable	Sat	No
Mould Bay	Minor	1	7950	112	No Entry	Acceptable	Sat	No
Radstock Bay	Minor	1	7952	26	No Entry	Acceptable	Sat	No
Resolute Bay	Anchorage	13	7527	204	36	Good	Sat	No
Tangarway Fiord	Major	13	7533	204	36	Acceptable	Sat	Yes
Rea Point	Anchorage	3	7920	82	No Entry	Good	Sat	No
	Commercial	6	7830	112	No Entry	Bad	Unsat	No

(1) Based on an icebreaker (Arctic Class 3).

(2) Based on an unstrengthened vessel.

TABLE 12D
PORTS & ANCHORAGES IN THE ARCTIC BY LOCATION
HUDSON BAY/UNGAVA/FOX E BASIN

Name	Category	Pollution Control Zone	Chart #	Duration in Days of Nav. Season		Degree of Shelter Afforded (Good/Bad or Acceptable)	Anchorage (Sat or Unsat)	Ship/Shore Communications
				(1)	(2)			
Inouicijuac (Port Harrison)	Minor	—	5471	204	103	Acceptable	Sat	Yes
Cape Dorset	Minor	15	5451	255	108	Bad	Unsat	No
Opiasfield Inlet (Settlement)	Minor	16	5340	219	123	Bad	Unsat	Yes
Churchill	Major	—	5400, 5409, 5408-5596	103	84	Good	Sat	Yes
Coral Harbour	Minor	14	5410	204	103	Acceptable	Unsat	Yes
Deception Bay	Minor & Commercial	15	5457	225	108	Good	Sat	No data
Diana Bay	Anchorage	15	5452, 5300	225	108	Good	Sat	No
Douglas Harbour	Anchorage	15	5391, 5365	225	108	Good	Sat	No
Erik Cove	Abandoned	14	5412	204	103	Bad	Sat	No data
Eskimo Point	Minor	16	5398	219	123	Bad	Sat	Yes
Fort Albany	Minor	—	5476	180	108	Bad	Unsat	Yes
Fort Chimo	Major	—	5461, 5462, 5463	225	108	Acceptable	Sat	No data
Fort George	Major	—	5800, 5801	165	61	Bad	Sat	Yes
Hall Beach	Minor	8	7452, 7401, 7067	164	61	Bad	Unsat	No
Iqloolik	Minor	8	7455, 7410	164	61	Acceptable	Sat	No
Ivujivik	Minor	14	5412	204	103	Bad	Unsat	No
Lake Harbour	Minor	15	5455	225	108	Good	Sat	No data
Longstaff Bluff	Minor	8	7470	164	61	Acceptable	Sat	Yes
Leaf Bay	Anchorage	—	5467	225	108	Good	Sat	No
Mission Cove (Koartac)	Minor	15	5452	225	108	Bad	Unsat	No data
Moosonee	Major	—	5860	160	108	Acceptable	Sat	Yes
Payne Bay (Bellin)	Minor	15	5352, 5351	225	108	Good	Sat	Yes
Port Burwell	Minor	15	5350, 5450	225	108	Acceptable	Sat	Yes
Povungtuk	Minor	14	5475	204	103	Acceptable	Sat	Yes
Rankin Inlet	Commercial	16	5445	219	123	Acceptable	Sat	Yes
Repulse Bay	Minor	8	7430	164	61	Bad	Unsat	No
Rupert House	Minor	—	5415	150	108	Bad	Sat	No
Sugluk	Minor	15	5438	225	108	Acceptable	Sat	Yes
Wakeham Bay	Minor	15	5390, 5365	225	108	Acceptable	Sat	Yes
Whale Cove	Minor	16	5397	219	123	Acceptable	Unsat	Yes

(1) Based on an Icebreaker (Arctic Class 3).

(2) Based on an unstrengthened vessel.

TABLE 12E
PORTS & ANCHORAGES IN THE ARCTIC BY LOCATION
LABRADOR COAST

Name	Category	Pollution Control Zone	Chart #	Duration in Days of Nav. Season		Degree of Shelter Afforded (Good/Bad or Acceptable)	Anchorage (Sat or Unsat)	Ship/Shore Communications
(1)	(2)			(1)	(2)			
Cartwright	Minor	—	5138	194	163	Good	Sat	Yes
Davis Inlet	Minor	—	4730	194	163	Acceptable	Sat	Yes
Goose Bay	Major	—	4728)	194	163	Good	Sat	Yes
			4722)					
Hebron	Minor	—	4765)	90±		Acceptable	Sat	No data
Hopedale	Minor	—	4751	120	90	Acceptable	Sat	Yes
Nain	Minor	—	4748	120±		Acceptable	Sat	Yes
Makkovik	Minor	—	5232	120±		Bad	Sat	Yes
Posville	Minor	—	4730	No data		Acceptable	Sat	No data
Pigloie	Minor	—	4724	160±		Acceptable	Unsat	Yes
Saglek Bay	Minor	—	4766	90±		Good	Sat	No data
Spotted Is. (for Black Tickle also)	Minor	—	4744)	140±		Bad	Unsat	No data
			4745)					

(1) Based on an Icebreaker (Arctic Class 3). (2) Based on an unstrengthened vessel.

3.3.2 Selected Sites

Altogether 87 ports and anchorages have been identified. In general, all of them are considered capable of providing the needed measure of shelter and/or support.

3.3.3 Pollution Control Zone

The number indicated refers to a zone in the Arctic designated by the Arctic Shipping Pollution Prevention Regulations, a publication of the *Ministry of Transport* acting for the Government of Canada. This restricts the various classes of ships to specific operating dates corresponding to the expected ice conditions and depending on the vessel's ice classification.

3.3.4 Chart Number

The chart number listed indicates the Canadian Hydrographic Service reference number for marine charts.

3.3.5 Degree of Shelter

The degree of shelter was determined by judgement and was based upon the direction and strength of winds, the tidal range and currents, ice movement and surrounding land configuration.

3.3.6 Anchorage

The anchorage was appraised using judgement and considering the quality of the sea bottom, the depth of anchorage and its distance from the beach, the tidal range and the swinging room available to vessels at anchor.

3.4 SOURCES AND CONTACTS

The following sources were utilized in collecting data on the marine system portion of this study. Personal knowledge of Capt. T.C. Pullen has been a primary source of much of the data.

Lloyds Register of Ships for 1967-68, 1976-77, 1977-78.

List of Shipping 1976-77.

Lloyds List of Shipowners 1976-77.

Ministry of Transport After-Action Reports: PACER DEW, PACER PINE & PACER BASIN 1970-1977.

Ministry of Transport After-Action Reports: Hudson Bay & Frobisher Bay Sea-lifts 1971-1977.

Ministry of Transport After-Action Reports: Resolute Bay Sea-lifts 1970-1977.

Pilot of Arctic Canada:

Volume I — General

Volume II — Eastern Arctic

Volume III — Western Arctic

Labrador & Hudson Bay Pilot

Radio Aids to Marine Navigation (Atlantic & Great Lakes)

Radio Aids to Marine Navigation (Pacific Region)

Climate of the Canadian Arctic, Marine Sciences Branch, Department of Environment 1970.

Arctic Shipping Pollution Prevention Regulations.

Symbols and Abbreviations used on Canadian Charts 1976.

Charts issued by the Canadian Hydrographic Service as shown on Tables 12A to 12E.

3.5 UPDATING

With the passage of time ships shown on Tables 10 and 11 will, on account of age, sale or transfer, no longer be employed in northern waters and will be replaced by others. For instance, Salen of Stockholm which at present has a contract to ship lead/zinc concentrates from Strathcona Sound to Antwerp in its own vessels (*Gothic Wasa*, *Baltic*

Wasa, etc.) for a period of 3 years will eventually be replaced by a new Canadian icebreaking bulk carrier, the M/V *Arctic*. Such deletions from and additions to the arctic shipping scene must be reflected in the listings.

Similarly, listings should show changes in the Coast Guard icebreaker fleet, either when new construction appears on the scene (e.g. the 2 new 'R' class icebreakers being built on the west coast) or when temporary changes occur (e.g. when existing ships are taken in hand for long refits).

3.6. SPECIAL TECHNOLOGY AND FUTURE DEVELOPMENTS

3.6.1 New Mines

Arvik, Cominco's lead/zinc deposit on Little Cornwallis Island is awaiting development when world prices for those minerals recover from their present depressed state. At that time, of course, berthing facilities matching those serving Nanisivik on Strathcona Sound will be constructed. Shipment of the year's production, about 200,000 tons of concentrates will be accomplished during the summer navigation season by suitably strengthened bulk carriers.

When the iron ore body at Mary River on North Baffin is developed the product will be shipped to Europe on a year-round basis in a fleet of icebreaking ore carriers displacing at least 200,000 tons. Production at the outset would be 2 million tons of direct shipping ore rising after a year or so to 4 million tons. Port facilities would likely be established at the bottom of Milne Inlet where there is good shelter and water.

3.6.2 Oil

While oil has not yet been found in the high arctic in commercial quantities, the on-going effort to find it continues and the likelihood must be that a significant find will ultimately be made. If and when this occurs, delivery to southern markets will likely be by icebreaking tankers built for the purpose. This too would be a year-round operation by vessels displacing 200,000 tons.

3.6.3. The Polar Gas Project

The Polar Gas Project presented (in Dec. 1977) a submission to the National Energy Board (NEB), and through it to the Government, for approval to proceed with its plan to build a pipeline from the Arctic islands southward along the Boothia Peninsula and the west coast of Hudson Bay to southern markets. In all, it represents a 3,500 mile undertaking which will have an enormous impact on ships and shipping over a period of at least 5 years. The intention is to transport 1½ million tons of cargo into Hudson Strait and a wide variety of destinations in the high arctic. The closest project to rival the magnitude of the Polar Gas Project was the construction of the Distant Early Warning (DEW) Line 20 years ago.

Once the construction phase has been completed there will be an on-going commitment to re-supply all the sites annually. To accomplish this will call for the services of 2 or 3 extremely powerful servicing vessels built to high icebreaking standards. In addition, of course, a number of ships, probably chartered and likely unstrengthened, would bring cargo into selected redistribution ports for stockpiling and onward delivery by the icebreaking vessels above.

3.6.4. Liquid Natural Gas (LNG) by the Marine Mode

A strong competitor in the arctic transportation field with the Polar Gas Project is the Arctic Petro Carriers group which is planning to liquefy arctic island gas at Bridport Inlet on Melville Island and ship it to an eastern Canadian port by means of icebreaking ships.

Sufficient reserves of gas have already been established to justify such a marine mode whereas very much more will have to be proven before the all-pipeline project can be seriously considered as an alternative. Arctic Class 7 LNG icebreakers would be employed displacing about 150,000 tons and operating year-round delivery between 12 and 14 shiploads yearly.

It should be noted that the liquefaction plant, and many other facilities would be constructed in the south and then be moved north on barges which would be joined together and placed in a suitable sheltered refuge. Such a 'modular' approach will be used for all large projects and will have a heavy impact on the arctic marine scene calling for special towing/pushing operations to ensure delivery at site with accompanying icebreaker escort.

3.6.5 The Beaufort Sea

Dome Petroleum is at present pushing a proposal to build or acquire an Arctic Class 10 icebreaker (the ultimate icebreaker) and has suggested that Government underwrite a share of the cost. Whatever happens, and should that vessel be built, the icebreaking capability that would become available in the Beaufort Sea, in support of the off-shore drilling program there, would not only ensure the safety of the drill-ships but could extend the season by a substantial amount.

3.6.6. Miscellany

In 1974 an ice-strengthened (Type 'B' — Arctic Shipping Pollution Prevention Regulations) vessel designed especially for the role, carried 95 tourists into the high arctic penetrating Kane Basin (80 degrees north latitude) and as far west as Barrow Strait (beyond Resolute Bay). This was the first serious attempt to introduce tourists by sea to that region and was an unqualified success.

Flowing from this it has now been learned that the sponsors and operators of the ship are planning two more cruises, this time through the Northwest Passage entering from the west. They would take place in 1979 if the necessary approvals and clearances can be obtained.

During 1977 another first was established when two private yachts attempted, and succeeded, in 'sailing' through the Northwest Passage. One was Dutch and the other Canadian. There will be others in the future. Such endeavours are risky, achieve little of significance and represent a charge on the taxpayers because the Coast Guard must monitor the progress of such vessels in the event they become beset and threatened.

4.0 SUMMARY OF LAND SYSTEMS

The land system is not a significant consideration in supply to the north in comparison with the air or marine modes.

4.1 RAIL ACCESS TO THE NORTH

Rail access does not penetrate north of Hay River in the Northwest Territories or Whitehorse in the Yukon Territory. Rail does reach Churchill on Hudson Bay and Moosonee on James Bay and can be used to ship goods to Churchill Falls in Labrador.

All of these lines are connected to the southern systems directly by a standard gauge (4 ft. 8½") track except the White Pass and Yukon Route which has a No. 3 gauge track (3'-0") to Skagway and a ferry connection to Vancouver. The equipment on these lines is capable of accommodating passengers and substantial volumes of heavy material.

Each of these railways has sufficient storage area and off-loading facilities at their northern points to act as a mode transfer point in the supply line to the northern support bases in the event of an oil spill. Freight is carried by barge from Hay River to the Beaufort Sea via the Mackenzie River or by ship to the Hudson-Ungava Bay area from Churchill or Moosonee. No easy connection can be made to the Labrador Coast but a trail does exist to Goose Bay and could be sufficiently upgraded in the future.

4.2 ROAD ACCESS TO THE NORTH

4.2.1 All Weather Roads

Direct road access to the Northwest Territories and the Yukon Territory is possible year-round within a 3,600 mile network of roads.

Edmonton, Alberta is the main southern city connected to Hay River and Yellowknife in the Northwest Territories and as far north as Dawson City and Whitehorse in the Yukon.

The system is primarily a gravel surfaced network with an approximate width of 24 feet and design speed of 80 KPH (50 MPH). Bridges are numerous and are generally of timber construction capable of carrying loads within the territorial restrictions under a 15 KPH speed limit. These restrictions can be exceeded through the purchase of a permit from the respective territory and use of specially designed trailers and pilot cars to the resident engineer's satisfaction.

There are various trucking companies out of Whitehorse, Yukon; Edmonton and Peace River, Alberta that run regularly scheduled or contracted services to communities on these all-weather roads. Communities with regular service are as follows:

- Hay River, N.W.T.
- Pine Point, N.W.T.
- Fort Smith, N.W.T.
- Fort Resolution, N.W.T.
- Fort Providence, N.W.T.
- Rae/Edzo, N.W.T.
- Yellowknife, N.W.T.
- Fort Simpson, N.W.T.
- Whitehorse, Y.T.
- Mayo, Y.T.
- Dawson City, Y.T.
- Beaver Creek, Y.T.

It should be noted that there is at present an all-weather road between Inuvik and Fort McPherson but since it is not yet connected to the network, permanent road access to the Arctic coast cannot be considered as a supply line to northern communities. At best, roads could be used to supply arctic communities through Hay River via barge along the Mackenzie River or Yellowknife and Whitehorse via airfreight.

In the eastern portion of the Canadian north, road access to the coast is limited to Fort George, Quebec, and Happy Valley/Goose Bay, Labrador. The paved road to Fort George is feasible as a direct supply line to northern communities. To the Labrador coast however, supplies must be transported by rail to Esker, Labrador and then by a gravel track through private land to the port of Happy Valley/Goose Bay.

4.2.2 Ferries

Large river crossings are frequently serviced by car ferry in the north due to the high construction cost of a bridge. Currently there are five ferries in operation and their characteristics are listed in Table 13. These ferries cannot operate all year round and ice bridges are constructed in the winter months. This solution, however, still leaves 60 — 90 days per year during freeze-up and break-up periods when traffic is unable to cross.

TABLE 13
FERRY DATA

Community	River	Type of Ferry	Capacity (Tons)	Ferry Season	Ice Bridge Season
Fort Providence	MacKenzie	Car Ferry	100	June 1- Nov 15	Dec 15- Apr 15
Ford Simpson	Liard	Car Ferry	65	May 15- Nov 1	Dec 1- Apr 15
Ross River	Pelly	Cabled Barge	N/K	Summer on Demand	Nil
Dawson City	Yukon	Car Ferry	65	May 15- Oct 15	N/K
Arctic Red River	MacKenzie	Car Ferry	20	N/K	N/K

N/K — not known

4.2.3 Winter Roads

During the winter months, roads are built of snow and ice as temporary access roads to small communities normally serviced only by air. There are literally thousands of miles of these roads throughout Northern Canada but they are of little concern due to their local function of stockpiling supplies.

A major winter road has been constructed in the past along the Mackenzie Valley from Fort Simpson to Inuvik. Demand for such a road is very low and has not justified opening it up every year on a regular and reliable basis although it is being constructed in 1978.

There are two of these roads of importance in the MacKenzie River Delta area. One is a 65 mile access road to Aklavik and the other is a 120 mile road to the settlement of Tuktoyaktuk from Inuvik. Both are maintained on a regular basis out of Inuvik and provide winter access from a major settlement to an air and marine port respectively.

4.3 AIR CUSHION VEHICLES

Air cushion vehicles (ACVs) are capable of carrying loads over water, ice and terrain inaccessible to other forms of surface transport.

The Northern Transportation Company was the first to employ ACV's in the arctic as supply vessels to nearby off-shore drilling rigs, in the Beaufort Sea. Centred in Inuvik, these vessels operated satisfactorily year-round in all types of weather. However, as the drilling rigs moved farther off-shore in search of oil, the distances involved were beyond the ACV operating range. As a result, these vessels have been taken out of service.

The only ACV at present in operation in the Canadian north is at Tompkins Landing in Northern Alberta. It is a pilot project in the use of hovercraft for ferries across large river crossings. A 66 foot vessel is used to transport vehicles across the Peace River on a winched cable system. Although operational difficulties are being encountered, the service rendered by this vessel is considered good since the freeze-up and break-up shut downs of the conventional ferry are eliminated.

4.4 SOURCES AND CONTACTS

The collection of data on land systems has utilized various sources within the public and private sector. These contacts are listed below in four groups; rail, road, truck and air cushion vehicle transport.

4.4.1 Rail Contacts

Mr. Jack H. Wood
Traffic Manager
White Pass and Yukon Route
701 West George Street
Vancouver, B.C.
V7Y 1E6 Tel. (604) 683-7221

Mr. A.J. Dove
Traffic Manager
Northern Alberta Railways
13023 St. Albert Trail
Edmonton, Alberta
T5L 4L4 Tel. (403) 452-6160

Mr. J.E. Skinner
Regional Manager
Administrative and Technical Services
Prairie Region
Canadian National Railways
123 Main Street
Winnipeg, Manitoba
R3C 2P8 Tel. (204) 946-2323

Mr. John Wallace
Chief Engineer
Facility Maintenance
Ontario Northland Railway
195 Regina Street
North Bay, Ontario Tel. (705) 472-4500

Mr. G.A. Dolliver
Superintendent
Train Movement Department
Quebec North Shore & Labrador Railway
Sept-Iles, Quebec

Mr. William Fry
Director, Tariffs and Subsidies Control
Traffic and Tariffs Branch
Canadian Transport Commission
Congill Building
275 Slater Street
Ottawa, Ontario
K1A 0N9 Tel. (613) 995-9404

4.4.2 Road Contacts

Societe de Developpement de la Baie James
Mr. Gilles Lepinat, eng.
Engineering Dept.
SD BJ
800 E. Maisonneuve boulevard
Montreal, Quebec

Mr. Moussa Habak, eng.
chief
Engineering Dept.
SD BJ
800 E. Maisonneuve boulevard
Montreal, Quebec

Department of Public Works

Mr. Jim Fullerton
Chief Highways Engineer
Transportation Division
Sir Charles Tupper Building
Confederation Heights
Room E — 540
Ottawa, Ontario Tel. (613) 998-8032

Mr. J. Beauchamp
Chief Bridge Engineer
(same as above) Tel. (613) 998-4510

Mr. G.W. Baker
Director of Facilities
Maintenance Services
(same as above) Tel. (613) 998-4719

Department of Indian Affairs & Northern Development

Mr. Roop Agarwal
Highway Engineer
Transportation Division
Journal Building
South Tower, 15th Floor
Ottawa, Ontario Tel. (613) 996-2551

Mr. Fred Welling
Senior Planning Engineer
(same as above) Tel. (613) 996-2551

Mr. Cliff Wolf
Construction Technologist
(same as above) Tel. (613) 996-2551

Mr. Mike Chettleburgh
Senior Maintenance Engineer
(same as above) Tel. (613) 996-9525

4.4.3 Trucking Contacts

Mr. John Bell
Operations Manager
Byers Transport
7420 125A Avenue
Edmonton, Alberta Tel. (403) 479-2021

Mr. Ted Gosche
Traffic Manager
Grimshaw Trucking Co.
11510 151 Street
Edmonton, Alberta Tel. (403) 452-5820

Mr. Peter Graham
Secretary-Treasurer
Hay River Truck Lines
Hanger 16
Edmonton Industrial Airport
Edmonton, Alberta Tel. (403) 454-0696

Mr. R.J. Guindon
White Pass & Yukon Route
Highway Division
Whitehorse, Yukon Territory Tel. (403) 667-7611

Mr. Mel Hough
Operations Manager
KAPS Transport Ltd.
9303 51 Avenue
Edmonton, Alberta Tel. (403) 435-3861

Mr. Henry Kuhn
President
North West Commercial
Hauling Ltd.
Bay 2 — 10608 169 Street
Edmonton, Alberta Tel. (403) 489-5636

Mr. Hank Shatko
Operations Manager
Northgate Transport Ltd.
9233 58 Avenue
Edmonton, Alberta Tel. (403) 435-5707

Mr. George Hominuk
President
Northline Transport

Highway 14 E & 26 Street
Edmonton, Alberta Tel. (403) 962-2121

Ms. Judy Taylor
Northwest Transport Ltd.
12232 156 Street
Edmonton, Alberta Tel. (403) 452-9601

4.4.4 Air Cushion Vehicle Contacts

Mr. R.G. Wade
Superintendent
A.C.V. Engineering
Air Cushion Vehicle Division
Canadian Coast Guard
Transport Canada
Place de Ville
Ottawa, Ontario
K1A 0N7 Tel. (613) 995-6808

Mr. Bert W. Mead
Director, A.C.V. Operations
Northern Transportation Co. Ltd. (N.T.C.L.)
9945 108 Street
Edmonton, Alberta Tel. (403) 423-9201

4.4.5 Air Cushion Vehicle Data Sources

Gill, S.D.; *Dispersant Field Trials In Canadian Waters — The Use of Hovercraft As A Dispersant Spraying Platform*; Transport Canada; 1977.

Transport Canada; *Bell Voyageur 002 ACV — Cold Weather Evaluation*; August 1974.

Transport Canada; *Bell Voyageur 002 ACV — Engineering and Commercial Evaluation*; June 1975.

4.5 UPDATING

An accurate record of all new land transportation links opening up areas of the north or major reconstruction projects upgrading the quality or structural capacity of the links should be noted so that land-based support lines to the southern centres can be fully utilized.

4.6 FUTURE DEVELOPMENTS

Two major developments in the land network should be completed by 1980. Both are within the highway sector and involve major implications to multi-modal transit of freight and people to the north.

A road link from Carcross, Yukon to Skagway, Alaska is now under construction and will provide a direct link from Whitehorse, the capital city and major distribution centre for the Yukon, to a major port. This will complement the railway service now in operation and provide a better service with more flexibility.

Another road link currently under construction is the final stage of the Dempster Highway. It will connect the present all-weather road servicing Dawson City to Inuvik, thereby providing year-round land access to a major air distribution centre within the Arctic Circle. A further extension of this road to the port of Tuktoyaktuk is in the design stages and will be the first permanent land access to the Canadian Arctic coastline.

Societe de Developpement de la Baie James is at present studying the feasibility of three new links from the Matagami-Fort George road; to Fort Rupert, Eastmain and Nouveau Comptoir, all on James Bay.

Newfoundland is also planning a permanent link from Labrador City to Churchill Falls over a new alignment. There is an existing gravel track to Happy Valley/Goose Bay which could make coastal access possible.

The Motor Truck Jan/78 issue describes a proposal for a cable bridge across the Mackenzie River at Fort Providence. No official status can be attached to this proposal.

The Canadian Coast Guard is investigating some very promising future uses of air cushion vehicles in the Canadian north. Tests on the Bell Voyageur ACV in the MacKenzie Delta have proved the vessel's adaptability to cold climates and capability of traversing almost all types of topography. Along with its obvious potential as a supply vessel to operational bases during an oil spill countermeasure program, it has also been tested with success as a moving platform from which oil dispersants can be sprayed.

5.0 SUMMARY OF COMMUNITIES

The communities in the north are important as bases of supply and operation during any oil spill cleanup program. An evaluation of the equipment and manpower is a vital requirement in the development of contingency plans.

5.1 COMMUNITIES IN THE NORTH

A total of 90 sites has been identified in the review of community resources. The support facility characteristics of the various centres are detailed on Table 14. The table is broken into five parts corresponding to the five regions described in Chapter 1 as follows:

Table 14A	Western Arctic	25 communities
Table 14B	Eastern Arctic	12 communities
Table 14C	High Arctic	7 communities
Table 14D	Hudson Bay/Ungava/Foxe Basin	30 communities
Table 14E	Labrador Coast	<u>16 communities</u>
TOTAL		<u>90 communities</u>

It is interesting to note that JP2 is an all purpose fuel used for heating and for aircraft.

It is important to know the capabilities within the communities to provide two types of equipment; water transport vessels and construction equipment. Tables 15A, 15B, 15C, 15D and 15E give the water transport vessel characteristics by region. All vessels longer than 20' are listed. These vessels would be used to off-load supply ships and provide operational support for any oil spill cleanup. These tables clearly show that few of the communities will be able to make significant contribution in this manner.

Tables 16A, 16B, 16C, 16D and 16E list the available construction equipment by region. Some equipment is available in most communities but the quantities are limited. Grading equipment is generally available at all airports.

TABLE 14A
COMMUNITY SUPPORT FACILITY CHARACTERISTICS
WESTERN ARCTIC

File No.	Name	Coordinates		Population	Documented Transportation Services				Medical Services			Communication			Fuel Supplies				Shelter Capacity (beds)	Food Capacity (man-days)	Labour Force	Storage			
		N	W		Air	Marine	Rail	Road	First Aid Station	Nursing Station	Hospital	Nurses	Doctors	Regular Telephone	Radio Telephone	Satellite	Microwave	Gas	Diesel	Oil	Heating Fuel	Sheltered (ft ²)	Airstrip	Beach	Other
S5001	Aklavik	68°- 12'	135°-00'	800	x			x		x		3				x	x	x	x	x	x	50			
S5006	Bathurst Inlet	66°- 52'	108°-01'	56	x			x	x										x	x		25			
S5007	Bay Chimo	67°- 41'	107°-56'	75		x		x	x					x											
S5010	Byron Bay	68°- 55'	108°-30'	10	x				x																
S5011	Cambridge Bay	69°- 06'	105°-08'	923	x	x		x	x	x		4	1			x	x	x				100+			
S5016	Cape Parry	70°- 10'	124°-42'	35	x	x		x	x													56			
S5018	Cape Young	68°- 56'	116°-56'	14	x	x		x	x													20			
S5022	Clinton Point	69°- 35'	120°-44'	14	x	x		x	x													20			
S5024	Coppermine	67°- 50'	115°-05'	756	x	x		x	x	x		2				x	x	x				500			
S5035	Gjoa Haven	68°- 38'	95°-57'	410	x	x		x	x	x		2				x	x	x				1500			
S5036	Gladman Point	68°- 39'	97°-45'	10	x	x		x	x													11			
S5043	Holman Island	70°- 43'	117°-43'	350	x	x		x	x													14.400	Limit.		
S5046	Inuvik*	68°- 22'	133°-43'	4,150	x	x		x	x	x		52	7									130.000	10,000		20,000
S5049	Jenny Lind Is.	68°- 50'	101°-44'	10	x	x		x	x													500			
S5051	Komukuk Beach	69°- 36'	140°-10'	14	x	x		x	x													4			
S5052	Lady Franklin Point	68°- 29'	113°-13'	10	x	x		x	x													20			
S5061	Nicholson Peninsula	69°- 57'	128°-54'	14	x	x		x	x													4			
S5066	Paulatuk	69°- 49'	123°-59'	113	x	x		x	x													20			
S5069	Perry River	67°- 43'	102°-14'	Aband																		10			
S5075	Reed Island	69°- 12'	114°-31'	Aband																					
S5081	Sachs Harbour	71°- 59'	125°-13'	167	x	x		x		x		1													
S5083	Shepherd Bay	68°- 48'	93°-24'	12	x	x		x	x													4			
S5084	Shingle Point	68°- 56'	137°-14'	14	x	x		x	x													500			
S5085	Spence Bay	69°- 32'	93°-31'	433	x	x		x	x			2										10			
S5086	Tuktoyaktuk	69°- 27'	133°-02'	750	x	x		x		x		3										100			

*Questionnaire not returned

TABLE 14B
COMMUNITY SUPPORT FACILITY CHARACTERISTICS
EASTERN ARCTIC

File No.	Name	Coordinates		Population	Documented Transportation Services	Medical Services	Communication	Fuel Supplies	Shelter Capacity (beds)	Food Capacity (man-days)	Labour Force	Storage			
		N	W									Sheltered (ft ²)	Airstrip	Beach	Other
S5003	Arctic Bay	73°-02'	85°-11'	353	x						20	42,000	200,000	264,000	Unl.
S5009	Broughton Is.	67°-32'	63°-47'	395	x						50		43,000		
S5012	Cape Christian (1)	70°-31'	68°-18'	Aband	x										
S5014	Cape Dyer	66°-39'	61°-21'	64	x						<10				
S5015	Cape Hooper	68°-28'	66°-47'	10	x						<10				
S5023	Clyde River	70°-25'	68°-30'	390	x						20				
S5032	Fort Ross	72°-00'	94°-14'	Aband	x										
S5033	Frobisher Bay	63°-44'	68°-28'	2418	x						100+				
S5060	Nanisivik	73°-10'	84°-30'	265	x						80+				
S5063	Padloping Is.	67°-03'	62°-42'	Aband	x										
S5064	Pangnirtung	66°-08'	65°-44'	960	x						50+				
S5070	Pond Inlet	72°-41'	78°-00'	550	x						30				

(1) Although Cape Christian is abandoned, it has full support facilities including accommodation for 30 people, kitchen facilities, first aid post, diesel plant, etc.

TABLE 14C
COMMUNITY SUPPORT FACILITY CHARACTERISTICS
HIGH ARCTIC

File No.	Name	Coordinates		Population	Documented Transportation Services	Medical Services	Communication				Shelter Capacity (beds)	Food Capacity (man-days)	Labour Force	Storage			
														Sheltered (ft ³)	Airstrip	Beach	Other
S5002	Alert*	82°-31'	62°-18'	214	x								50	NIL	NIL		
S5030	Eureka	79°-59'	85°-57'	10	x								<10	NIL	40,000		
S5038	Grise Fiord	76°-25'	82°-53'	129	x								20	NIL	Unit		
S5047	Isachsen	78°-47'	103°-33'	14	x								<10	NIL			
S5058	Mould Bay	76°-14'	119°-20'	15	x								<10	NIL			
S5076	Rea Point	75°-22'	105°-42'	100	x								50	NIL	Unit	Unit	
S5078	Resolute Bay	74°-41'	94°-54'	556	x								100	NIL	NIL	1,000,000	

*Questionnaire not returned.

TABLE 14D
COMMUNITY SUPPORT FACILITY CHARACTERISTICS
HUDSON BAY/UNGAVA/FOX E BASIN

File No.	Name	Coordinates		Population	Documented Transportation Services	Medical Services	Communication			Fuel Supplies				Shelter Capacity (beds)	Food Capacity (man-days)	Labour Force	Storage			
																	Sheltered (ft ²)			Open (ft ²)
		Airstrip	Beach				Other													
S5004	Aupaluk	60°-30'	69°-45'	45												14,000				
S5005	Baker Lake	64°-18'	96°-03'	900	x											1500	50+	50,000	Unl.	
S5013	Cape Dorset	64°-14'	76°-32'	750	x	x										1500	50	22,500	Unl.	Unl
S5017	Cape Smith	60°-50'	78°-45'	Aband.																
S5020	Chesterfield Inlet	63°-21'	90°-42'	305	x	x										500	20			
S5025	Coral Harbour	64°-08'	83°-10'	375	x	x										1500	50	25,000	50,000	
S5027	Deception Bay*	62°-07'	74°-35'	5	x	x														
S5028	Dewar Lakes	68°-37'	71°-07'	10												500	<10			
S5029	Eskimo Point	61°-07'	94°-03'	875	x	x										500				
S5031	Fort Chimo	58°-06'	68°-25'	813	x	x										1500	50			
S5034	George River	58°-41'	65°-58'	291	x	x										1500	50+	30,000		
S5039	Hall Beach	68°-46'	81°-11'	325	x	x										500	20	5,000	20,000	
S5045	Iqloolik	69°-24'	81°-49'	750	x	x										1500	50			
S5048	Ivujivik	62°-25'	77°-54'	144	x	x										1500	50			
S5050	Koartac	61°-02'	69°-37'	123	x	x											10			
S5053	Lake Harbour	62°-51'	69°-53'	224	x	x											<10			
S5054	Leaf Bay	58°-50'	69°-25'	98	x	x										1500	20	5,000		
S5055	Longstaff Bluff	68°-56'	75°-17'	74	x	x											<10			
S5056	Mackay Inlet	68°-21'	85°-45'	10	x	x										500	<10			
S5067	Payne Bay	59°-56'	69°-45'	279	x	x										500	<10			
S5068	Pelly Bay	68°-53'	89°-51'	250	x	x										500	20	150,000	NIL	
S5071	Port Burwell	60°-25'	64°-50'	50	x	x										500	20	NIL		
S5073	Povungnituk	60°-03'	77°-14'	795	x	x										60,000	10	60,000		
S5074	Rankin Inlet	62°-49'	92°-05'	1050	x	x										500	50			
S5077	Repulse Bay	66°-32'	86°-15'	274	x	x										1500	50			
S5079	Resolution Is.	61°-35'	64°-39'	Aband.**	x											500	20			
S5082	Suguk (Sagluoc)	62°-12'	75°-38'	450	x	x										500	20			
S5088	Wakeham Bay	61°-41'	71°-52'	236	x	x										500	20			
S5089	Whale Cove	62°-11'	92°-36'	172	x	x										500	20			
S5090	Wolstenholme	62°-32'	77°-24'	Aband.	x											36,000	20	36,000	Unl	Unl

**Data received Feb/78
*Questionnaire not returned

TABLE 14E
COMMUNITY SUPPORT FACILITY CHARACTERISTICS
LABRADOR COAST

File No.	Name	Coordinates		Documented Transportation Services	Medical Services		Communication		Fuel Supplies				Food Capacity (man-days)	Shelter Capacity (beds)	Labour Force	Sheltered (BT)	Storage		
		N	W						Gas	Diesel	Oil	Heating Fuel					Airship	Beach	Other
55000	Black Tackle*	53° 21'	53° 48'	x								x			50	NIL			
55010	Cartwright	53° 43'	57° 01'	x		2						x			50	40 000			
55021	Churchill Falls	53° 34'	54° 21'			18	2	x				x		140*	100*		some		
55026	Davis Inlet*	55° 54'	53° 57'	x		1		x				x			15	NIL			
55037	Goose Bay*	53° 15'	50° 22'	x		x		x**				x			100*				
55040	Happy Valley*	53° 17'	50° 16'	x		x		x**				x			100*				
55041	Hawke's Harbour*	53° 35'	57° 09'												100*				
55042	Hibern	58° 12'	52° 38'	x															
55044	Hopedale*	55° 27'	50° 12'	x		1		x				x			20	400 000			
55057	Makkovik*	55° 04'	59° 10'	x		1		x				x		10	20	NIL			
55058	Nain	56° 32'	61° 41'	x		2		x				x		12	50	NIL			
55062	North West River	53° 31'	60° 08'	x		x	11	4				x			50	NIL	900 000	317 000	
55065	Paradise River*	53° 27'	57° 15'									x			10				
55072	Postville*	54° 54'	59° 46'	x								x			10				
55080	Rigolet	54° 10'	58° 25'	x								x			15	NIL			
55087	Twin Falls*	53° 29'	54° 31'									x			10	NIL			
												x			10				total

*Data reduced File 7b

**Quantitative not reported

TABLE 15A
AVAILABLE WATER TRANSPORT VESSELS
WESTERN ARCTIC

File No.	Community Name	Long Liners					Peterhead Boats					Whale Boats					Trap Boats					Barges					Other				
		Number	Length (ft.)	Beam (ft.)	Draft (ft.)	Capacity (tons)	Number	Length (ft.)	Beam (ft.)	Draft (ft.)	Capacity (tons)	Number	Length (ft.)	Beam (ft.)	Draft (ft.)	Capacity (tons)	Number	Length (ft.)	Beam (ft.)	Draft (ft.)	Capacity (tons)	Number	Length (ft.)	Beam (ft.)	Draft (ft.)	Capacity (tons)	Number	Length (ft.)	Beam (ft.)	Draft (ft.)	Capacity (tons)
S5001	Aklavik																														
S5006	Bathurst Inlet																														
S5007	Bay Chimo																														
S5010	Byron Bay																														
S5011	Cambridge Bay																														
S5016	Cape Parry																														
S5018	Cape Young																														
S5022	Clinton Point																														
S5024	Coppermine	1	45																												
S5035	Gjoa Haven																														
S5036	Gladman Point																														
S5043	Holman Island																														
S5046	Inuvik*																														
S5049	Jenny Lind Island																														
S5051	Komakuk Beach																														
S5052	Lady Franklin Point																														
S5061	Nicholson Peninsula																														
S5066	Paulatuk																														
S5069	Perry River																														
S5075	Reed Island																														
S5081	Sachs Harbour																														
S5083	Shepherd Bay																														
S5084	Shingle Point																														
S5085	Spence Bay																														
S5086	Tuktoyaktuk (1)																														

(1) Beaufort Sea Operation — Imperial Oil — crew boats.

TABLE 15D
AVAILABLE WATER TRANSPORT VESSELS
HUDSON BAY/UNGAVA/FOX E BASIN

File No.	Community Name	Long Liners					Peterhead Boats					Whale Boats					Trap Boats					Barges					Other				
		Number	Length (ft.)	Beam (ft.)	Draft (ft.)	Capacity (tons)	Number	Length (ft.)	Beam (ft.)	Draft (ft.)	Capacity (tons)	Number	Length (ft.)	Beam (ft.)	Draft (ft.)	Capacity (tons)	Number	Length (ft.)	Beam (ft.)	Draft (ft.)	Capacity (tons)	Number	Length (ft.)	Beam (ft.)	Draft (ft.)	Capacity (tons)	Number	Length (ft.)	Beam (ft.)	Draft (ft.)	Capacity (tons)
S5004	Aupalak																														
S5005	Baker Lake																														
S5013	Cape Dorset	1	32			10	1	60																							
		1	42			15/20	1	40																							
S5017	Cape Smith																														
S5020	Chesterfield Inlet																														
S5025	Coral Harbour																														
S5027	Deception Bay*																														
S5028	Dewar Lakes																														
S5029	Eskimo Point	1	47																												
S5031	Fort Chimo	1	40																												
S5034	George River																														
S5039	Hall Beach	1	40																												
S5045	Igloodik	1	35																												
		1	40																												
S5048	Ivujivik																														
S5050	Koartac																														
S5053	Lake Harbour																														
S5054	Leaf Bay																														
S5055	Longstaff Bluff																														
S5056	Mackay Inlet																														
S5067	Payne Bay	1	26																												
S5068	Pelly Bay																														

(Continued)

TABLE 15D (Continued)
AVAILABLE WATER TRANSPORT VESSELS
HUDSON BAY/UNGAVA/FOX E BASIN

File No.	Community Name	Long Liners	Peterhead Boats	Whale Boats	Trap Boats	Barges	Other
		Capacity (tons)	Capacity (tons)	Capacity (tons)	Capacity (tons)	Capacity (tons)	Capacity (tons)
		Draft (ft.)	Draft (ft.)	Draft (ft.)	Draft (ft.)	Draft (ft.)	Draft (ft.)
		Beam (ft.)	Beam (ft.)	Beam (ft.)	Beam (ft.)	Beam (ft.)	Beam (ft.)
		Length (ft.)	Length (ft.)	Length (ft.)	Length (ft.)	Length (ft.)	Length (ft.)
		Number	Number	Number	Number	Number	Number
S5071	Port Burwell						
S5073	Povungnituk	10					
S5074	Rankin Inlet	1 40					
		2 47					
		1 40					
		1 50					
S5077	Repulse Bay		1 30		1 32		
S5079	Resolution Island	ABANDONED					
S5082	Sugluk (Sagloue)						
S5088	Wakeham Bay						
S5089	Whale Cove	1 47 14 4.3 17	1 42 9 2.5 11			1 54 16 2.5 37	1 47 14 3.7 18
S5090	Wolstenholme	ABANDONED					

*Questionnaire not returned.

TABLE 15F
AVAILABLE WATER TRANSPORT VESSELS
LABRADOR COAST

File No.	Community Name	Long Liners					Peterhead Boats					Whale Boats					Trap Boats					Barges					Other				
		Capacity (tons)	Draft (ft.)	Beam (ft.)	Length (ft.)	Number	Capacity (tons)	Draft (ft.)	Beam (ft.)	Length (ft.)	Number	Capacity (tons)	Draft (ft.)	Beam (ft.)	Length (ft.)	Number	Capacity (tons)	Draft (ft.)	Beam (ft.)	Length (ft.)	Number	Capacity (tons)	Draft (ft.)	Beam (ft.)	Length (ft.)	Number	Capacity (tons)	Draft (ft.)	Beam (ft.)	Length (ft.)	Number
S5008	Black Tickle*																														
S5019	Cartwright																														
S5021	Churchill Falls																														
S5026	Davis Inlet*																														
S5037	Goose Bay*																														
S5040	Happy Valley*																														
S5041	Hawke's Harbour*																														
S5042	Hebron																														
S5044	Hopedale*																														
S5057	Makkovik*																														
S5059	Nain																														
S5062	North West River																														
S5065	Paradise River*																														
S5072	Postville*																														
S5080	Rigolet																														
S5087	Twin Falls*																														

*Questionnaire not received.

TABLE 16A
AVAILABLE CONSTRUCTION EQUIPMENT
WESTERN ARCTIC

File No.	Community Name	Cranes		Asphalt Spreaders		Bull Dozers	Clamshells & Draglines	Trucks		Welding Equipment	Forklifts	Concrete Mixers	Municipal Vehicles	Farm Equipment	Freight Sledges/ Cargo Trailers
		Truck Mounted	Crawler Mounted					Liquid Cargo	Pick Up	Dump	Off Highway	Flat Bed			
S5001	Aklavik			4				2	8		2				2
S5006	Bathurst Inlet														
S5007	Bay Chimo			2											2
S5010	Byron Bay		1	5				3	1						2
S5016	Cambridge Bay		1	3				14	1						2
S5018	Cape Parry		1	2				5							2
S5022	Cape Young		1	2				3	1						2
S5024	Clinton Point		1	2				3							2
S5035	Coppermine		1	2				1	2						
S5036	Gjoa Haven			4				3	4						2
S5043	Gladman Point			2				3	1						
S5046	Holman Island			3				1	2						2
S5049	Inuvik*														
S5052	Jenny Lind Island			2											2
S5061	Komakuk Beach			2											3
S5066	Lady Franklin Point			2											2
S5069	Nicholson Peninsula			3											2
S5075	Nicholson Peninsula			1											5
S5081	Paulatuk														
S5083	Perry River														
S5084	Reed Island														
S5085	Sachs Harbour														
S5086	Shepherd Bay														
	Shingle Point														
	Spence Bay														
	Tuktoyaktuk														

* Questionnaire not returned.

[illegible]

TABLE 16C
AVAILABLE CONSTRUCTION EQUIPMENT
HIGH ARCTIC

File No.	Community Name	Asphalt Spreaders	Bull Dozers	Clamshells & Draglines	Cranes	Compaction Equip.	Distribution Trucks	Float Trucks	Front End Loaders	Generator Sets	Graders	Gravel Spreaders	Herman Nelsons	Pile Driving Equip.	Pumps	Scrapers (Earth Mov.)	Snow Track Vehicles	Snow Clearing Equip.	Shovels, Backhoes	Liquid Cargo	Pick Up	Dump	Off Highway	Flat Bed	Welding Equipment	Forklifts	Concrete Mixers	Municipal Vehicles	Farm Equipment	Freight Sledges/ Cargo Trailers
S5002	Alert*		1						1		1						1					1								1
S5030	Eureka		1						1								2						1							
S5038	Grise Fiord								1								1													
S5047	Isachsen		2						1		1						1													
S5058	Mould Bay		2						1		1						1													
S5076	Rea Point		16						16	51	8	14			15	1	9	1				14	3	15	7					20
S5078	Resolute Bay		8						8	8	4	10			1	1	5	7				28	5	12	5	5	1	1		7

*Questionnaire not returned.

TABLE 16D
AVAILABLE CONSTRUCTION EQUIPMENT
HUDSON BAY/LUNGAVA/FOXEBASIN

File No.	Community Name	Equipment																													
		Asphalt Spreaders	Bull Dozers	Clamshells & Draglines	Cranes		Compaction Equip.	Distribution Trucks	Float Trucks	Front End Loaders	Generator Sets	Graders	Gravel Spreaders	Herman Nelsons	Pile Driving Equip.	Pumps	Scrapers (Earth Mov.)	Snow Track Vehicles	Snow Clearing Equip.	Shovels, Backhoes	Trucks					Welding Equipment	Forklifts	Concrete Mixers	Municipal Vehicles	Farm Equipment	Freight Sledges/ Cargo Trailers
					Truck Mounted	Crawler Mounted																Liquid Cargo	Pick Up	Dump	Off Highway	Flat Bed					
S5004	Aupalak		1								1					2						2	1	1	1	1					6
S5005	Baker Lake		7		1							2		4		1															
S5013	Cape Dorset		1								2	1		1								3	5	2	1	1					2
S5017	Cape Smith																														
S5020	Chesterfield Inlet		2																												
S5025	Coral Harbour		2											1																	
S5027	Deception Bay*																														
S5028	Dewar Lakes		3			1																									3
S5029	Eskimo Point		1																												
S5031	Fort Chimo					1																									
S5034	George River																														
S5039	Hall Beach		4			1																									
S5045	Igloodik		5																												
S5048	Ivujivik																														
S5050	Koartac																														
S5053	Lake Harbour		1																												
S5054	Leaf Bay		1																												
S5055	Longstaff Bluff		3			1																									
S5056	Mackay Inlet		3			1																									
S5067	Payne Bay		2																												
S5068	Pelly Bay		7			1																									
S5071	Port Burwell		1																												
S5073	Povungnituk		2																												

(Continued)

TABLE 16D (Continued)

AVAILABLE CONSTRUCTION EQUIPMENT

HUDSON BAY/UNGAVA/FOX E BASIN

Freight Sledges/ Cargo Trailers											
Farm Equipment											
Municipal Vehicles											
Concrete Mixers											
Forklifts											
Welding Equipment											
Trucks	Flat Bed			1						1	
	Off Highway					2		2		3	
	Dump	2		1		2		2		2	
	Pick Up	13		2		1		10		2	
	Liquid Cargo	2								2	
Shovels, Backhoes											
Snow Clearing Equip.											
Snow Track Vehicles		2		1				2		2	
Scrapers (Earth Mov.)											
Pumps											
Pile Driving Equip.											
Herman Nelsons		3						1			
Gravel Spreaders											
Graders		1		1						1	
Generator Sets		2									
Front End Loaders		2		1		3		1		1	
Float Trucks											
Distribution Trucks											
Compaction Equip.											
Cranes	Truck Mounted	1									
	Crawler Mounted										
Clamshells & Draglines											
Bull Dozers		2		3		ABANDONED				1	
Asphalt Spreaders											
File No.	Community Name	Rankin Inlet Repulse Bay Resolution Island Sugluk (Sagluoc) Wakeham Bay Whale Cove Wolstenholme									

*Questionnaire not returned.

*Questionnaire not returned

5.2 SOURCES AND CONTACTS

The collection of data on community resources has utilized a number of sources. These sources are identified below by three major geographic areas, the Northwest Territories, Quebec and Labrador.

5.2.1 Northwest Territories

The prime data source utilized for communities in the Northwest Territories was a questionnaire sent to all the study communities. These questionnaires were sent, wherever possible, to specific individuals with whom members of the study team were familiar. When this was not possible the recipient was the Settlement Manager or his equivalent.

Data on many communities, along with airport data were obtained from Canadian Forces Northern Region Headquarters in Yellowknife. The contact was Captain C. Jordaan.

Data on DEW Line sites were obtained from the National Defence Headquarters in Ottawa. The contact for this information was Major R. Paukstaitis, Domestic Operations Section, Continental Plans Coordinator.

Considerable data were obtained from the 1977 Canada North Almanac, produced by the Research Institute of Northern Canada, Yellowknife.

Data on some communities were supplied by F. F. Slaney and Co. Ltd. in Vancouver who are involved in a similar study. The contact is Doris M. Morris. Fenco Consultants, of Calgary, who are also working on this study, providing data pertaining to some communities as well.

Information on individual sites was obtained from persons specifically contacted for that purpose. For example; data on Rea Point were kindly provided by L. J. Franklin, Vice-President, Operations, for Panarctic Oils Ltd.; data on Nanisivik were obtained from Mr. James of Strathcona Mineral Services Ltd. in Toronto.

Mr. G. W. Elliott, Manager, Designated Airports, Transport Canada (Winnipeg Office), was most helpful in providing extensive data for all communities where Transport Canada has a presence.

5.2.2. Quebec

Data on some communities in Quebec were obtained from the Canadian Transport Commission report on Isolated Communities, Digest of Transportation, Social and Economic Data (June 1977).

A considerable amount of data on northern Quebec communities was provided to us, through our Montreal office, by Mr. Eric Val of the Northern Quebec Inuit Association. Further data were provided by the Direction Générale du Nouveau-Québec (M. André Huot) and the Department of Indian and Northern Affairs (M. Claude Philippe) and, for information on Deception Bay, Mr. Dickson of Asbestos Corporation.

5.2.3. Labrador

Questionnaires were sent out to those Labrador communities within our study area. Further information about these communities was provided by Mr. A. Pike and Mr. A. Flynn, both with Labrador Services, Department of Rehabilitation and Recreation, to our St. John's office. Data on Churchill Falls were provided by Mr. A. Grant and Mr. S. Lewis, both with the Churchill Falls (Labrador) Corporation Limited.

5.3 UPDATING

The updating of data on a particular community can not be accurately completed without direct contact to the local authority. Contacts are provided on the Appendix sheets.

5.4 FUTURE DEVELOPMENTS

With increased exploration in the Canadian Arctic it is feasible that new communities could be established within a relatively short time period. This type of community must have good transportation facilities either by air and/or sea. Therefore, these locations are most likely to be suitable sites for operational bases and should be added to the resource inventory.

The requirements for a site to be considered suitable as an operations base may possibly change with changes in the use of various aircraft and ship type. For this reason future developments of a technological nature may make more of the existing settlements suitable as operational bases.

DATE DUE

99999 656:(*41N)
OSCLS-S

Oil spill countermeasure logistics
study : summary report.

Borrower's Name

Date Due

99999 656:(*41N)
OSCLS-S

Oil spill countermeasure logistics
study : summary report.

Boreal Institute for Northern
Studies Library
CW 401 Bio Sci Bldg
The University of Alberta
Edmonton, AB Canada T6G 2E9

University of Alberta Library



0 1620 0233 4132